ComfortBreeze®

SERVICE MANUAL

DC INVERTER
AIRCONDITIONER
SPLIT WALL-MOUNTED TYPE

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1. Precaution

1.1 Safety Precaution

- **To prevent injury to the user or other people and property damage, the following instructions must be followed.**
- **Incorrect operation due to ignoring instruction will cause harm or damage.**
- **Before service unit, be sure to read this service manual at first.**

1.2 Warning

➢ Installation

- **Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.**

There is risk of fire or electric shock.

- **For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized service center.**

Do not disassemble or repair the product, there is risk of fire or electric shock.

- **Always ground the product.**

There is risk of fire or electric shock.

- **Install the panel and the cover of control box securely.**

There is risk of fire of electric shock.

- **Always install a dedicated circuit and breaker.**

Improper wiring or installation may cause fore or electric shock.

- **Use the correctly rated breaker of fuse.**

There is risk of fire or electric shock.

- **Do not modify or extend the power cable.**

There is risk of fire or electric shock.

- **Do not install, remove, or reinstall the unit by yourself(customer).**

There is risk of fire, electric shock, explosion, or injury.

- **Be caution when unpacking and installing the product.**

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

- **For installation, always contact the dealer or an Authorized service center.**

There is risk of fire, electric shock, explosion, or injury.

- **Do not install the product on a defective installation stand.**

It may cause injury, accident, or damage to the product.

- **Be sure the installation area does not deteriorate with age.**

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

- **Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**

Moisture may condense and wet or damage furniture.

- **Take care to ensure that power cable could not be pulled out or damaged during operation.**

There is risk of fire or electric shock.

- **Do not place anything on the power cable.**

There is risk of fire or electric shock.

- **Do not plug or unplug the power supply plug during operation.**

There is risk of fire or electric shock.

- **Do not touch (operation) the product with wet hands.**

There is risk of fire or electric shock.

- **Do not place a heater or other appliance near the power cable.**

There is risk of fire and electric shock.

- **Do not allow water to run into electric parts.**

It may cause fire, failure of the product, or electric shock.

- **Do not store or use flammable gas or combustible near the product.**

There is risk of fire or failure of product.

- **Do not use the product in a tightly closed space for a long time.**

Oxygen deficiency could occur.

- **When flammable gas leaks, turn off the gas and open a window for ventilation before**

turn the product on.

Do not use the telephone or turn switches on or off.

There is risk of explosion or fire.

- **If strange sounds, or small or smoke comes from product. Turn the breaker off or disconnect the power supply cable.**

There is risk of electric shock or fire.

- **Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.**

There is risk of property damage, failure of product, or electric shock.

- **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

There is risk of physical injury, electric shock, or product failure.

- **When the product is soaked (flooded or submerged), contact an Authorized service center.**

There is risk of fire or electric shock.

- **Be caution that water could not enter the product.**

There is risk of fire, electric shock, or product damage.

- **Ventilate the product from time to time when operating it together with a stove, etc.**

There is risk of fire or electric shock.

- **Turn the main power off when cleaning or maintaining the product.**

There is risk of electric shock.

- **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**

There is risk of product damage or failure, or unintended operation.

- **Take care to ensure that nobody could step on or fall onto the outdoor unit.**

This could result in personal injury and product damage.

➢ CAUTION

- **Always check for gas (refrigerant) leakage after installation or repair of product.**

Low refrigerant levels may cause failure of product.

- **Install the drain hose to ensure that water is drained away properly.**

A bad connection may cause water leakage.

- **Keep level even when installing the product.**

To avoid vibration of water leakage.

- **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**

It may cause a problem for your neighbors.

- **Use two or more people to lift and transport the product.**

Avoid personal injury.

- **Do not install the product where it will be exposed to sea wind (salt spray) directly.**

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

➢ Operational

- **Do not expose the skin directly to cool air for long periods of time. (Do not sit in the draft).**

This could harm to your health.

- **Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigerant system.**

There is risk of damage or loss of property.

- **Do not block the inlet or outlet of air flow.**

It may cause product failure.

- **Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

There is risk of fire, electric shock, or damage to the plastic parts of the product.

- **Do not touch the metal parts of the product when removing the air filter. They are very sharp.**

There is risk of personal injury.

- **Do not step on or put anything on the product. (outdoor units)**

There is risk of personal injury and failure of product.

- **Always insert the filter securely. Clean the filter every two weeks or more often if**

necessary.

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

- **Do not insert hands or other object through air inlet or outlet while the product is operated.**

There are sharp and moving parts that could cause personal injury.

- **Do not drink the water drained from the product.**

It is not sanitary could cause serious health issues.

- **Use a firm stool or ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

- **Replace the all batteries in the remote control with new ones of the same type. Do not mix old and mew batteries or different types of batteries.**

There is risk of fire or explosion.

- **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**

They may burn of explode.

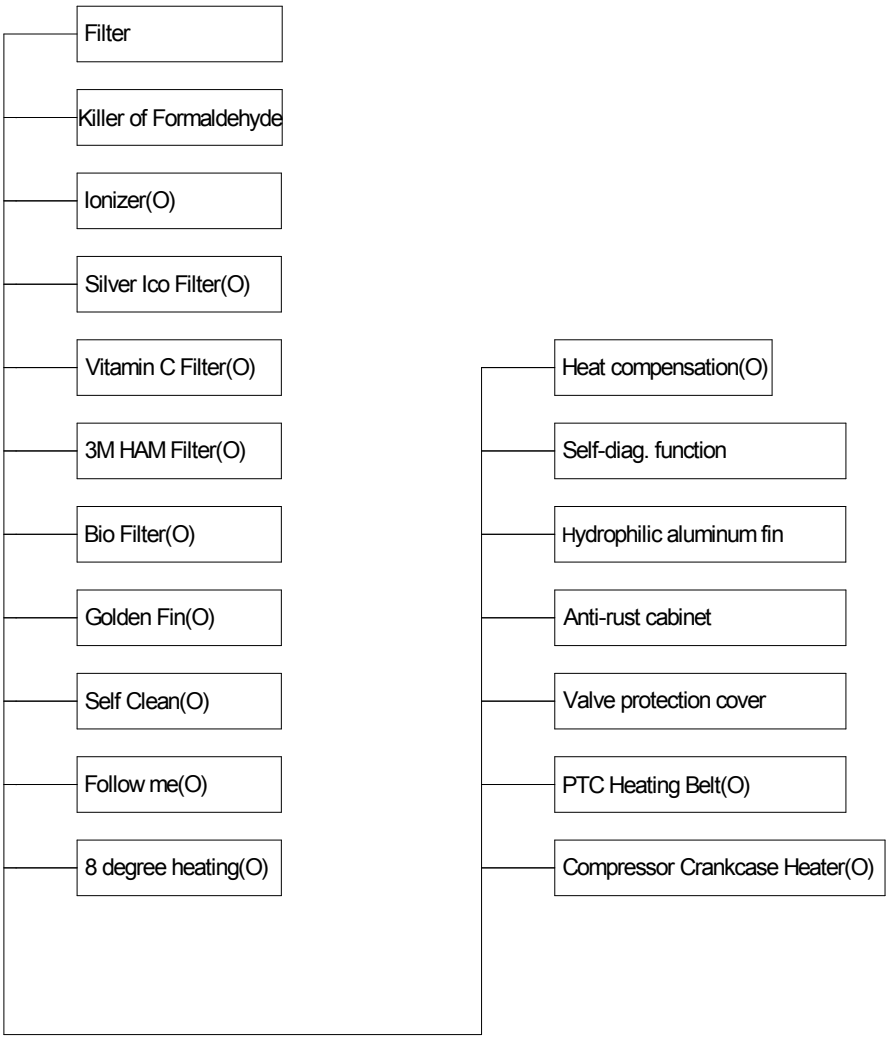
- **If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.**

The chemical in batteries could cause burns or other health hazards

2. Function

Model Names of Indoor/Outdoor Units

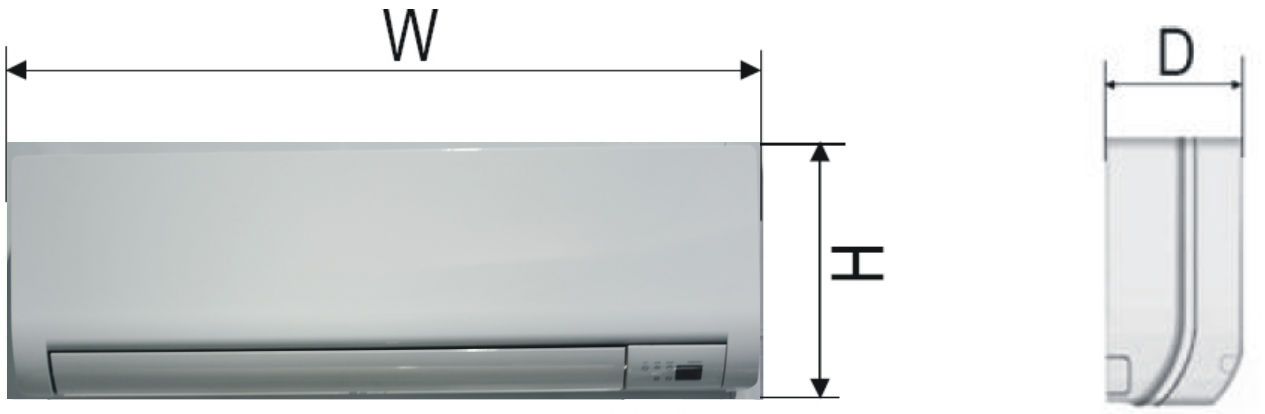
	Indoor units	Outdoor units
DC Inverter	CBZ-09CR9V-A1	CBZO-09CR9V-A1
	CBZ-12CR9V-A1	CBZO-12CR9V-A1
	CBZ-18CR9V-A1	CBZO-18CR9V-A1
	CBZ-24CR9V-A1	CBZO-24CR9V-A1



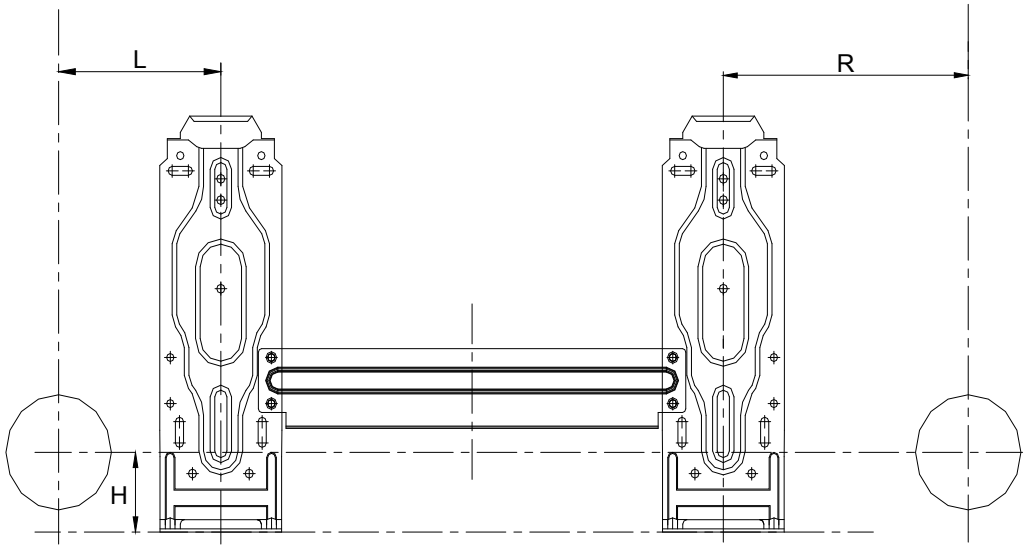
O: optional function

3. Dimension

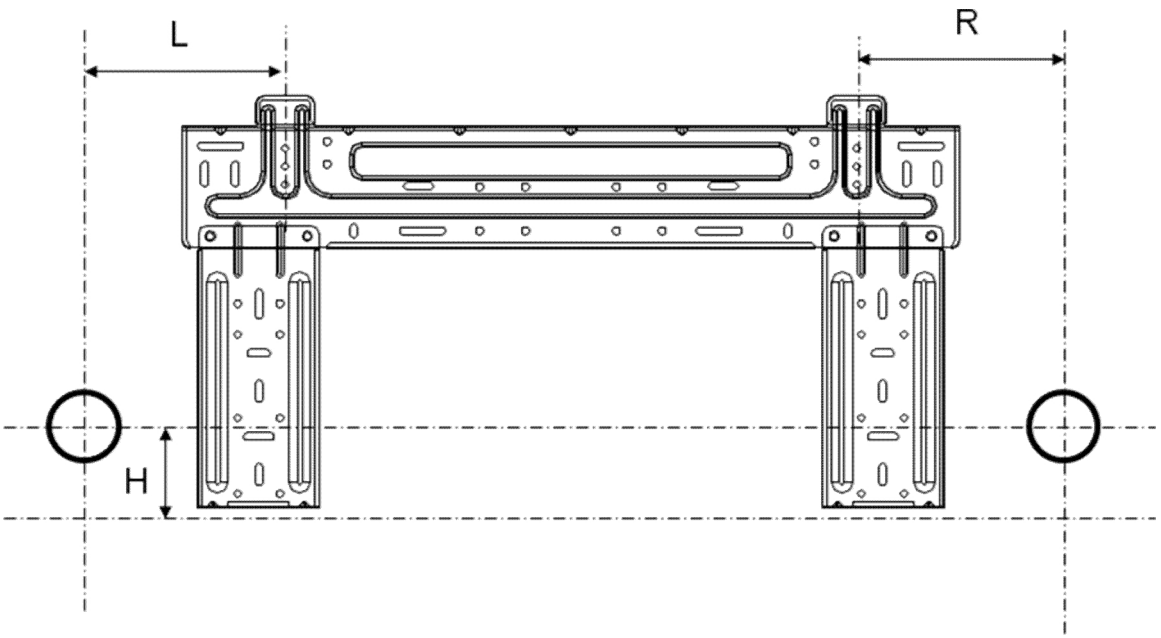
3.1 Indoor Unit



Dimension / Model	W	H	D
CBZ-09CR9V-A1	850	290	165
CBZ-12CR9V-A1	850	290	165
CBZ-18CR9V-A1	995	295	200
CBZ-24CR9V-A1	1084	320	221

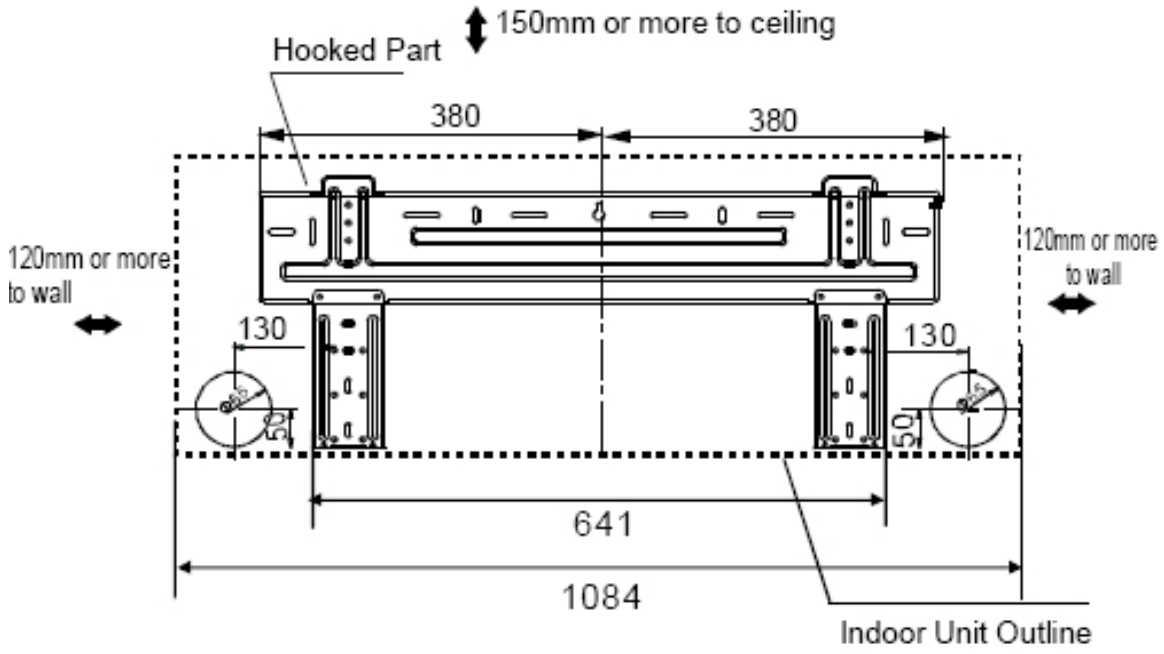


Model	R(mm)	L(mm)	H(mm)	Dimension of installation hole(mm)
CBZ-09CR9V-A1	114	100	45	Φ65
CBZ-12CR9V-A1	114	100	45	Φ65

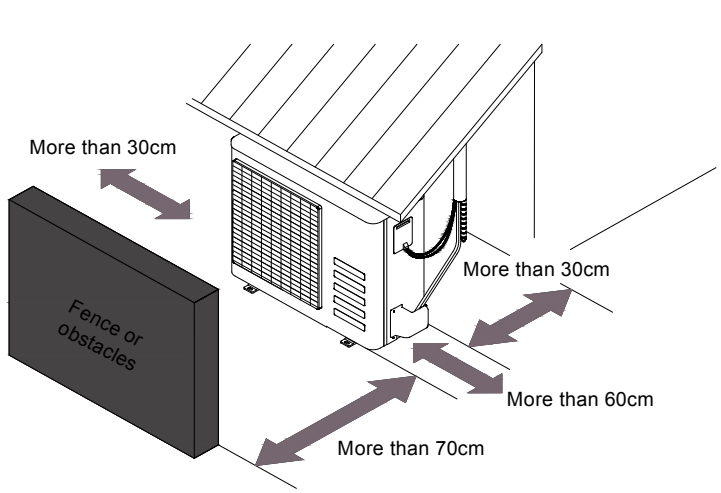


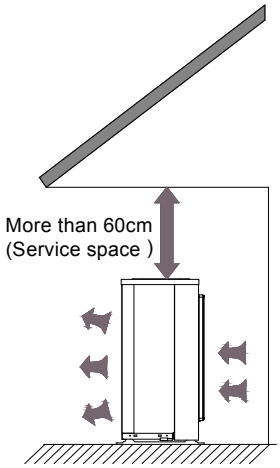
Model	R(mm)	L(mm)	H(mm)	Dimension of installation hole(mm)
CBZ-18CR9V-A1	201	150	45	Φ65

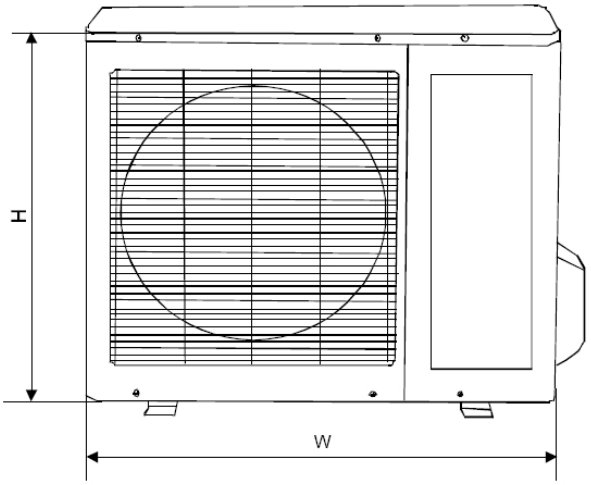
MS9V-24CRDN1-NC0W

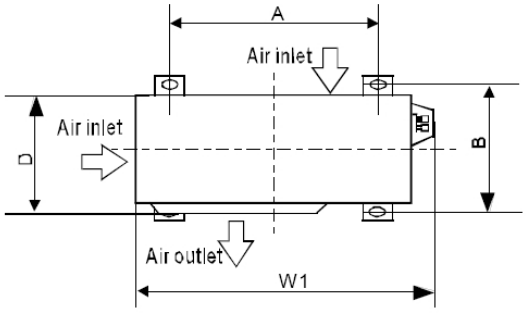


3.2 Outdoor Unit



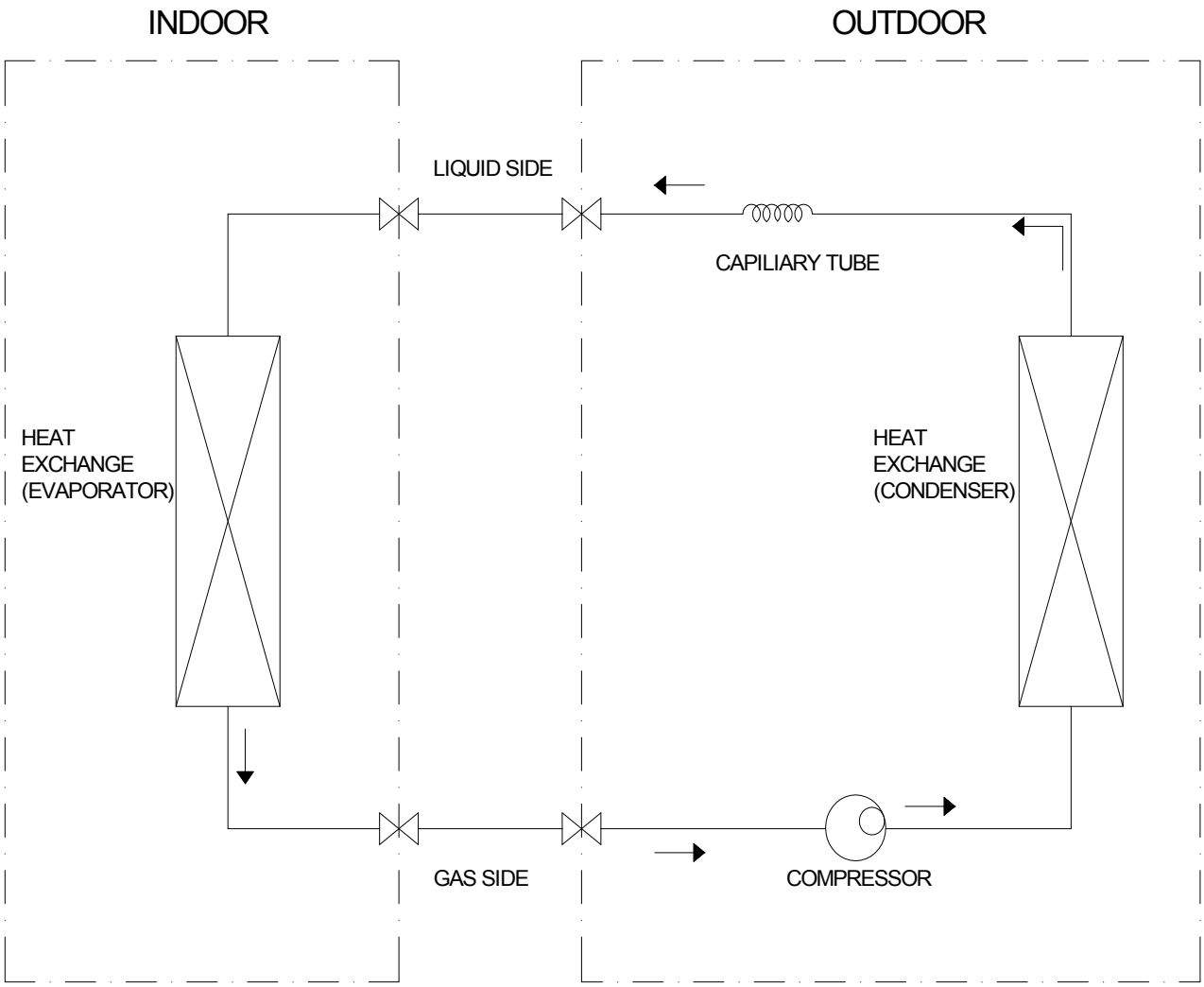






Dimension Mode	W	D	H	W1	A	B
CBZ-09CR9V-A1	700	240	540	757	458	250
CBZ-12CR9V-A1	780	250	540	843	549	276
CBZ-18CR9V-A1	760	285	590	823	530	290
CBZ-24CR9V-A1	845	335	695	918	560	335

4. Refrigerant Cycle Diagram

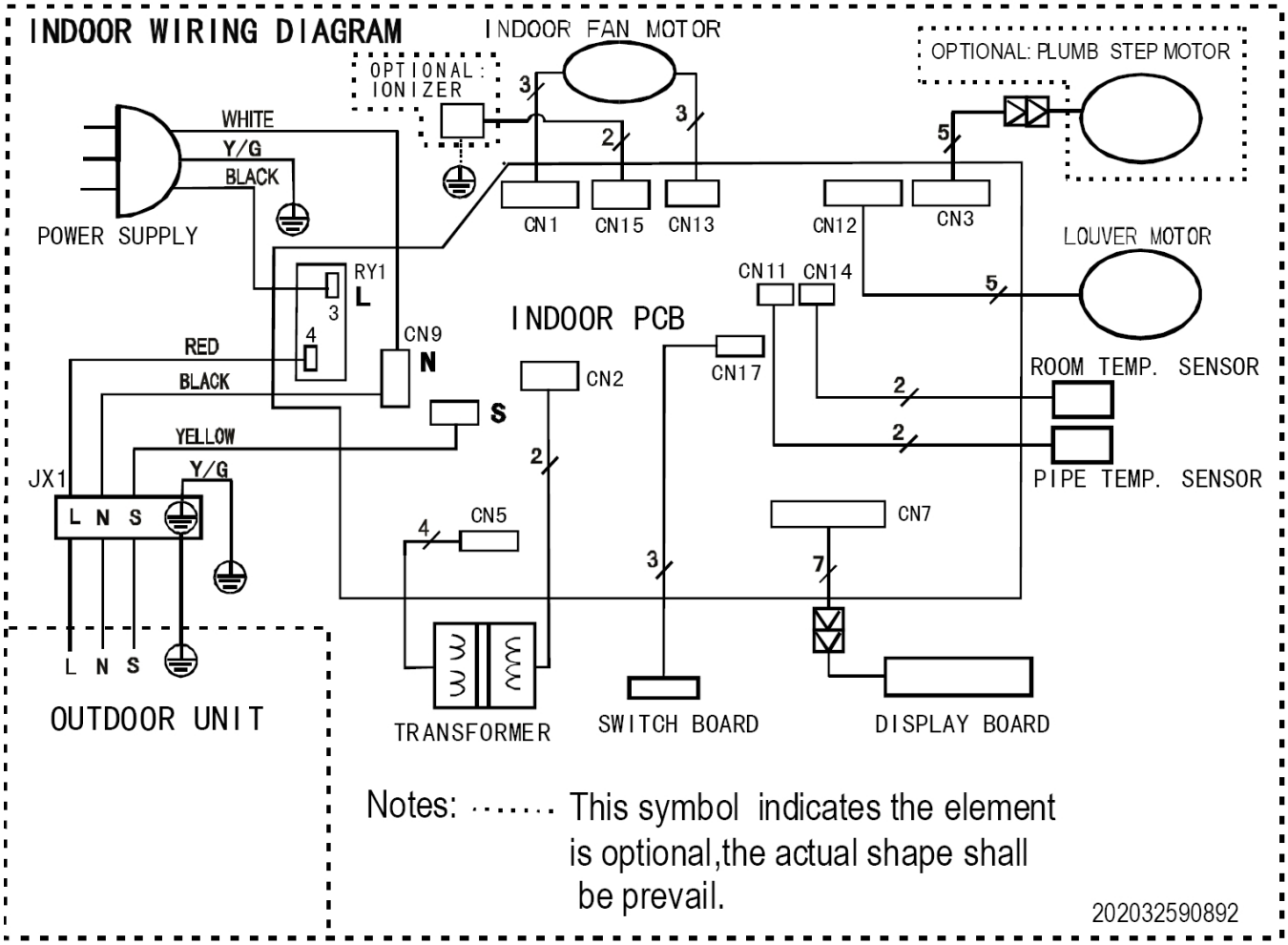


5. Wiring Diagram

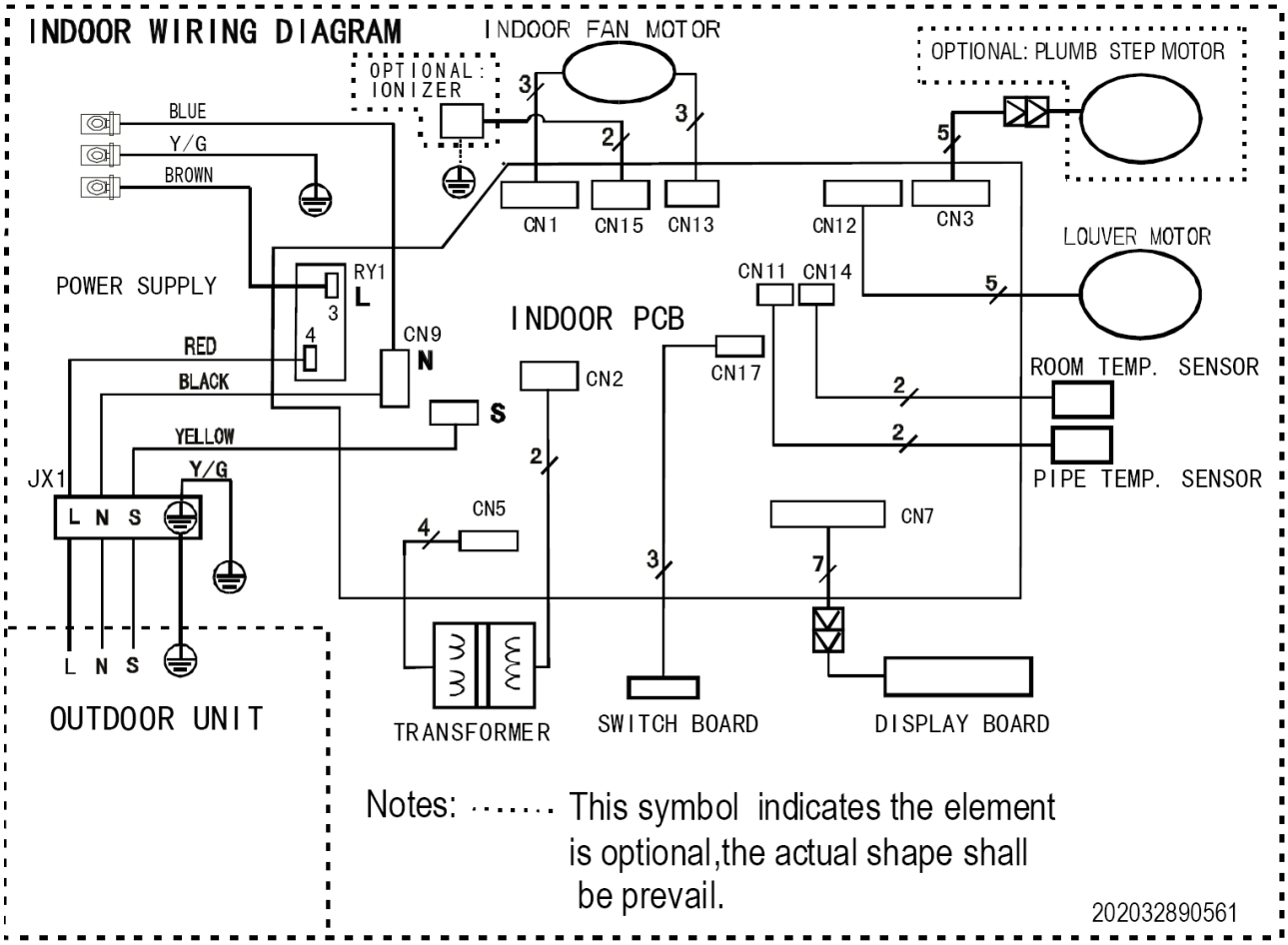
5.1 Indoor Unit

CBZ-09CR9V

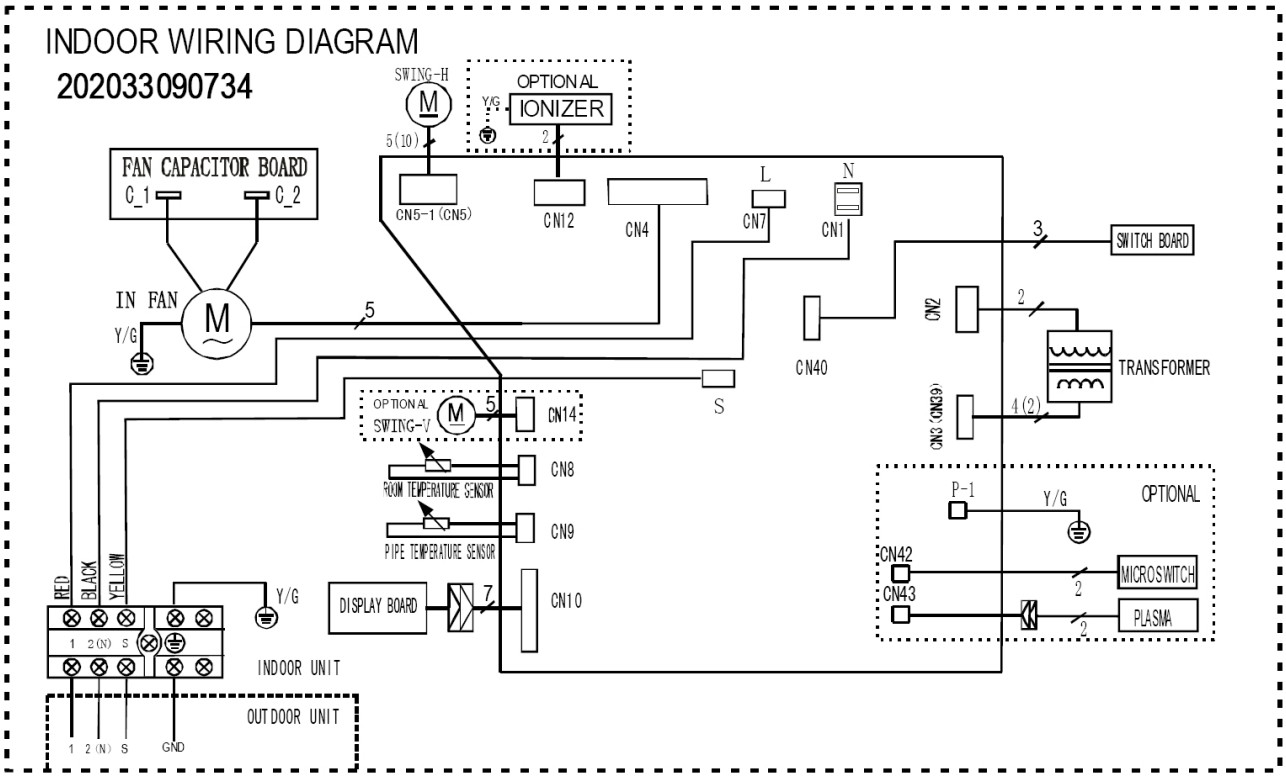
CBZ-12CR9V



CBZ-09CR9V-A1

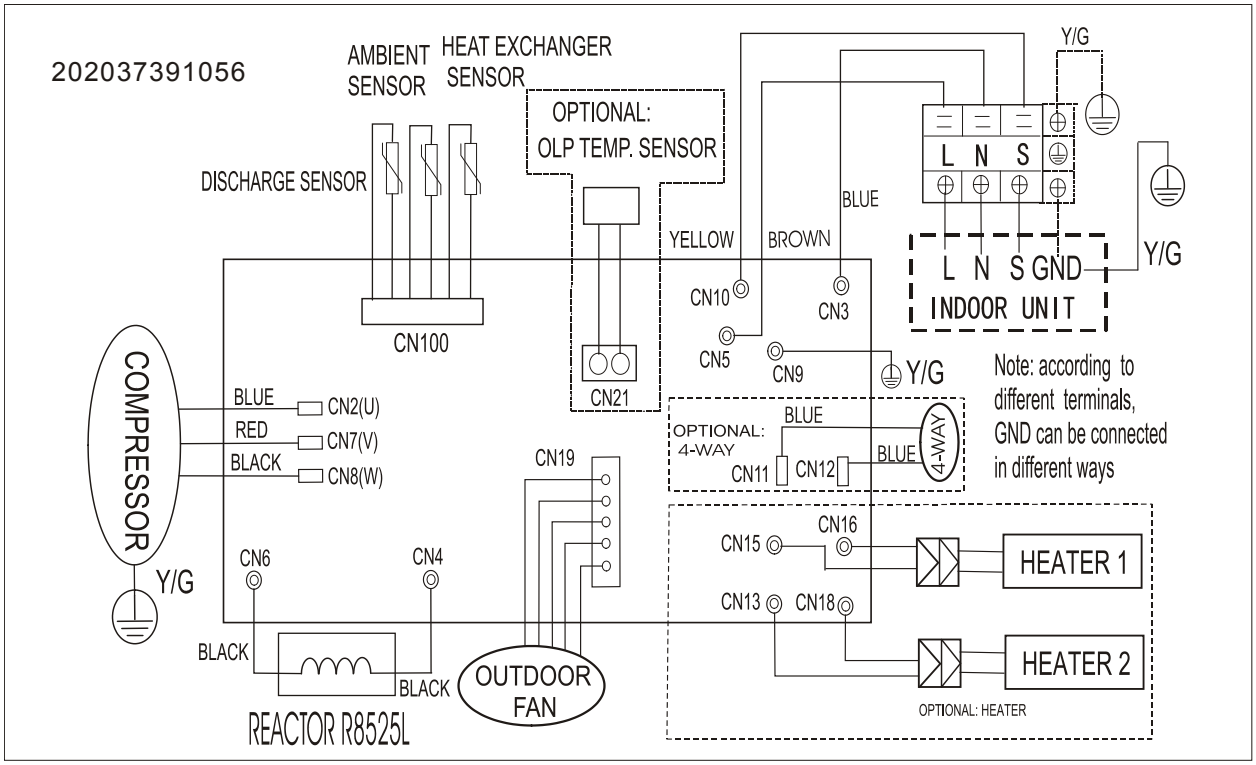


CBZ-12CR9V-A1

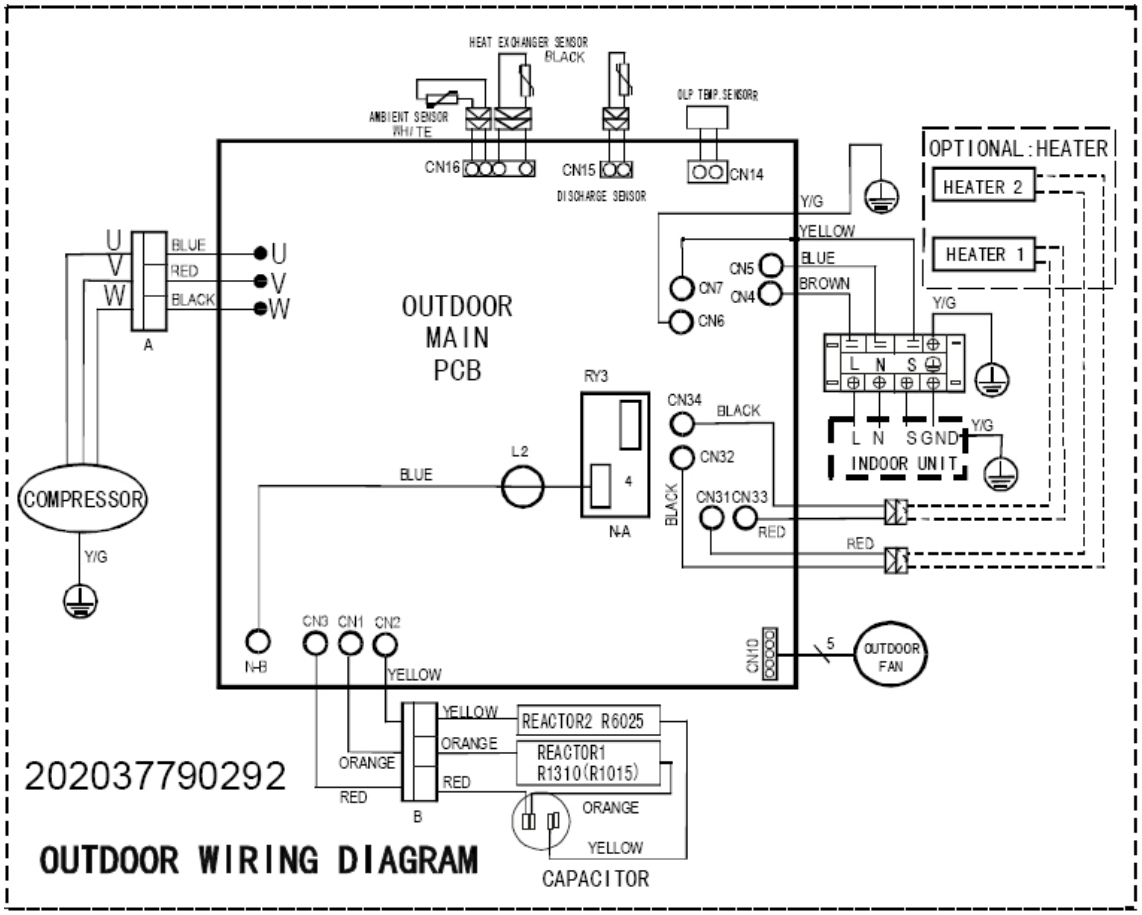


5.2 Outdoor Unit

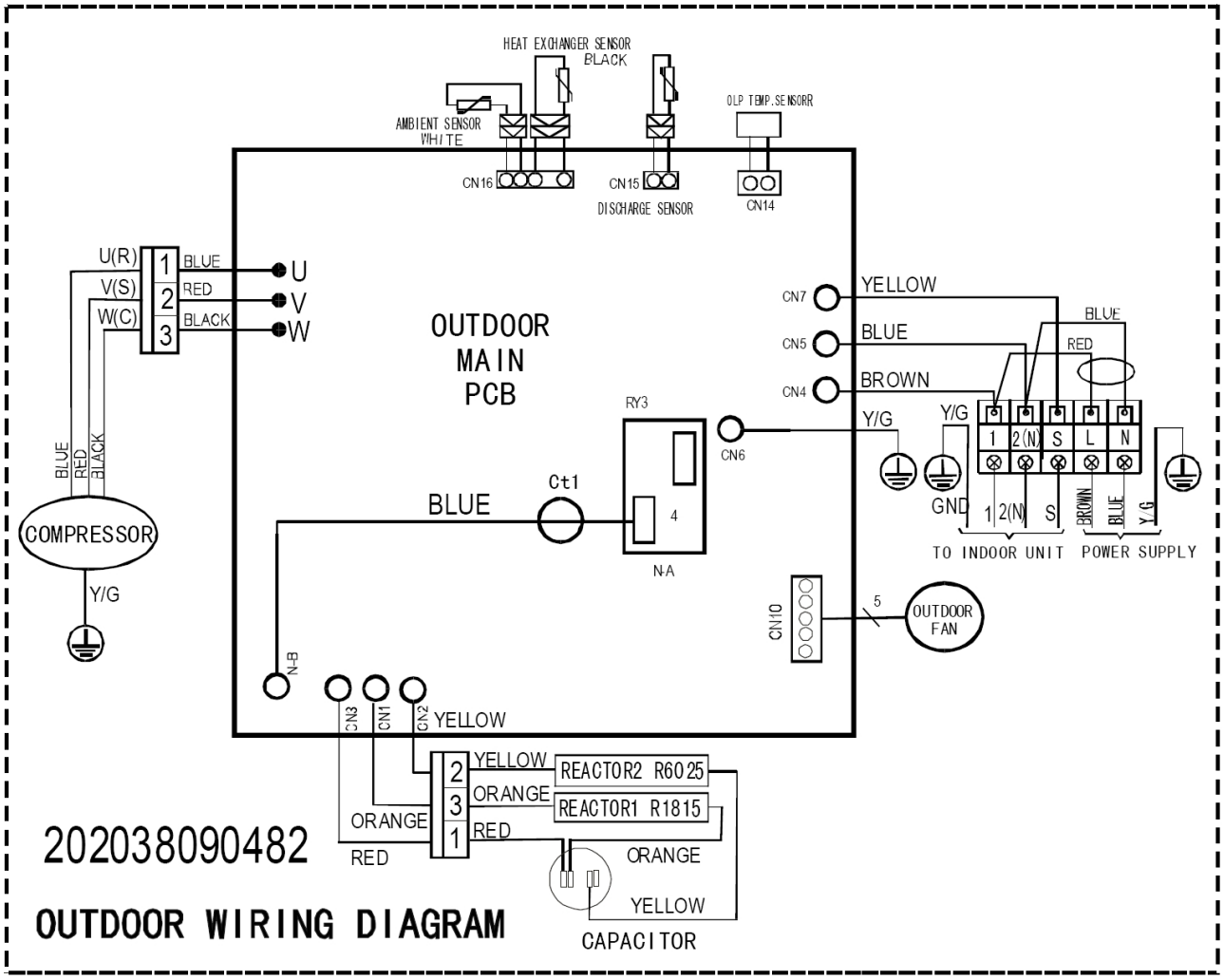
CBZO-09CR9V-A1, CBZO-12CR9V-A1



CBZO-18CR9V-A1



CBZO-24CR9V-A1



6. Installation details

6.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
mm	inch	N.cm	N.cm
Φ6.35	1/4	1500(153kgf.cm)	1600(163kgf.cm)
Φ9.52	3/8	2500(255kgf.cm)	2600(265kgf.cm)
Φ12.7	1/2	3500(357kgf.cm)	3600(367kgf.cm)
Φ15.9	5/8	4500(459kgf.cm)	4700(479kgf.cm)
Φ19	3/4	6500(663kgf.cm)	6700(683kgf.cm)

6.2 Connecting the cables

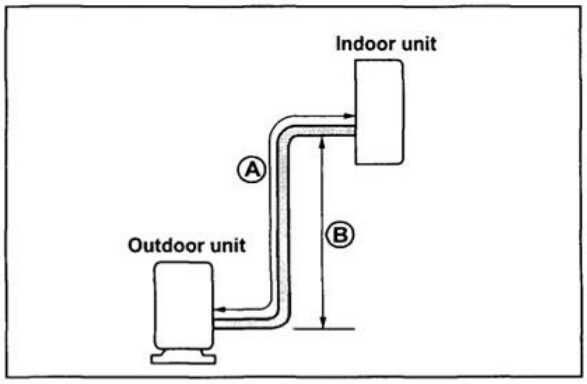
The power cord of connect should be selected according to the following specifications sheet.

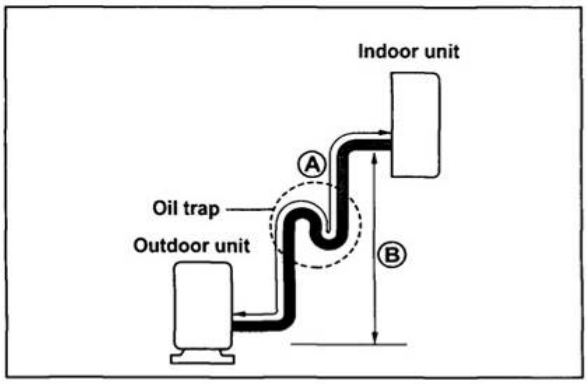
Rated current of appliance	Nominal cross-sectional area (mm^2)
>3 and ≤6	0.75
>6 and ≤10	1
>10 and ≤16	1.5
>16 and ≤25	2.5

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

6.3 Pipe length and the elevation

Capacity Btu/h	Pipe size		Standard length (m)	Max. Elevation B (m)	Max. Length A (m)	Additional refrigerant (g/m)
	Gas	Liquid				
CBZO-09CR9V-A1	3/8''(Φ9.52)	1/4"(Φ6.35)	5	8	20	20
CBZO-12CR9V-A1	1/2''(Φ12.7)	1/4"(Φ6.35)	5	8	20	20
CBZO-18CR9V-A1	1/2''(Φ12.7)	1/4"(Φ6.35)	5	10	25	20
CBZO-24CR9V-A1	5/8''(Φ15.9)	3/8''(Φ9.52)	5	10	25	40





Caution:

The capacity test is based on the standard length and the maximum permissive length is based on the system reliability.

The oil trap should be installed per 5-7 meters.

6.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

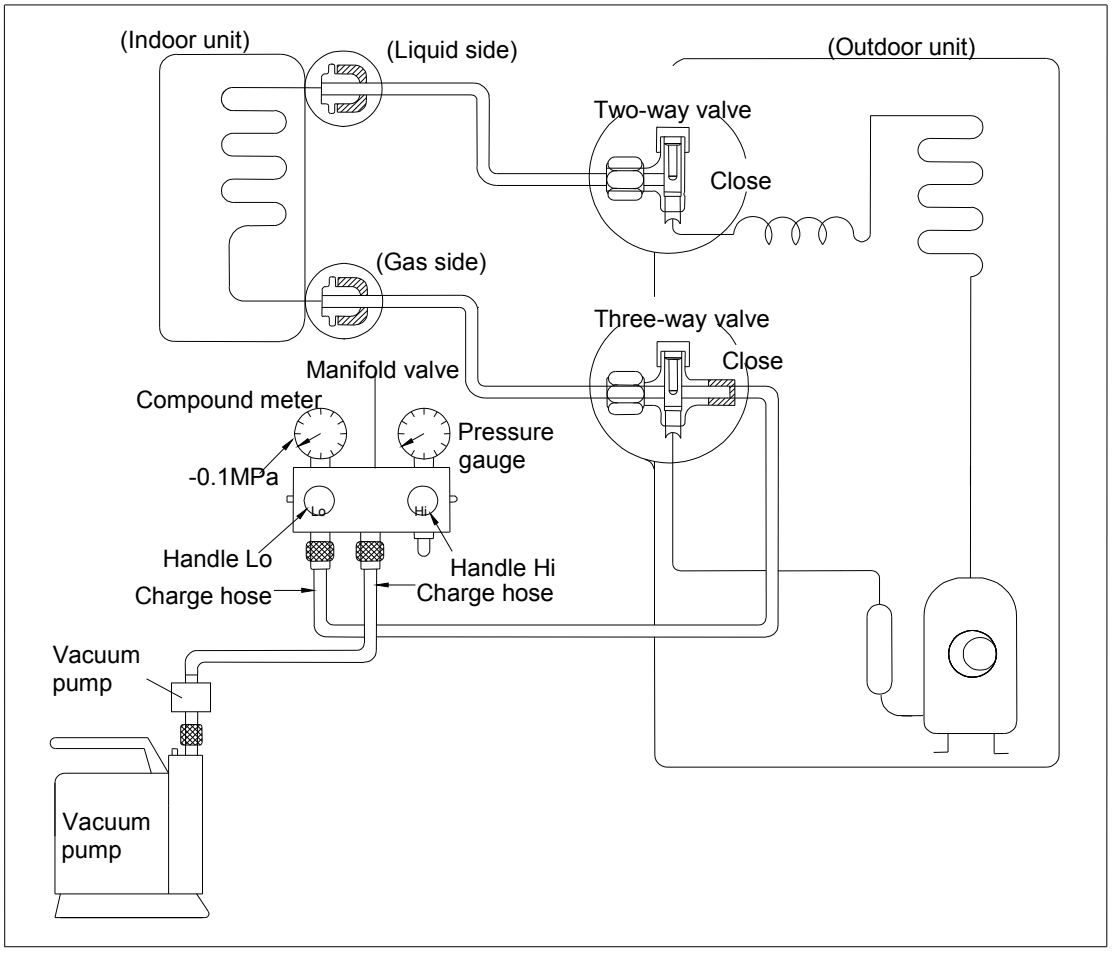
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump



1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
3) Connect the charge hose of handle hi connection to the vacuum pump.
4) Fully open the handle Lo of the manifold valve.
5) Operate the vacuum pump to evacuate.

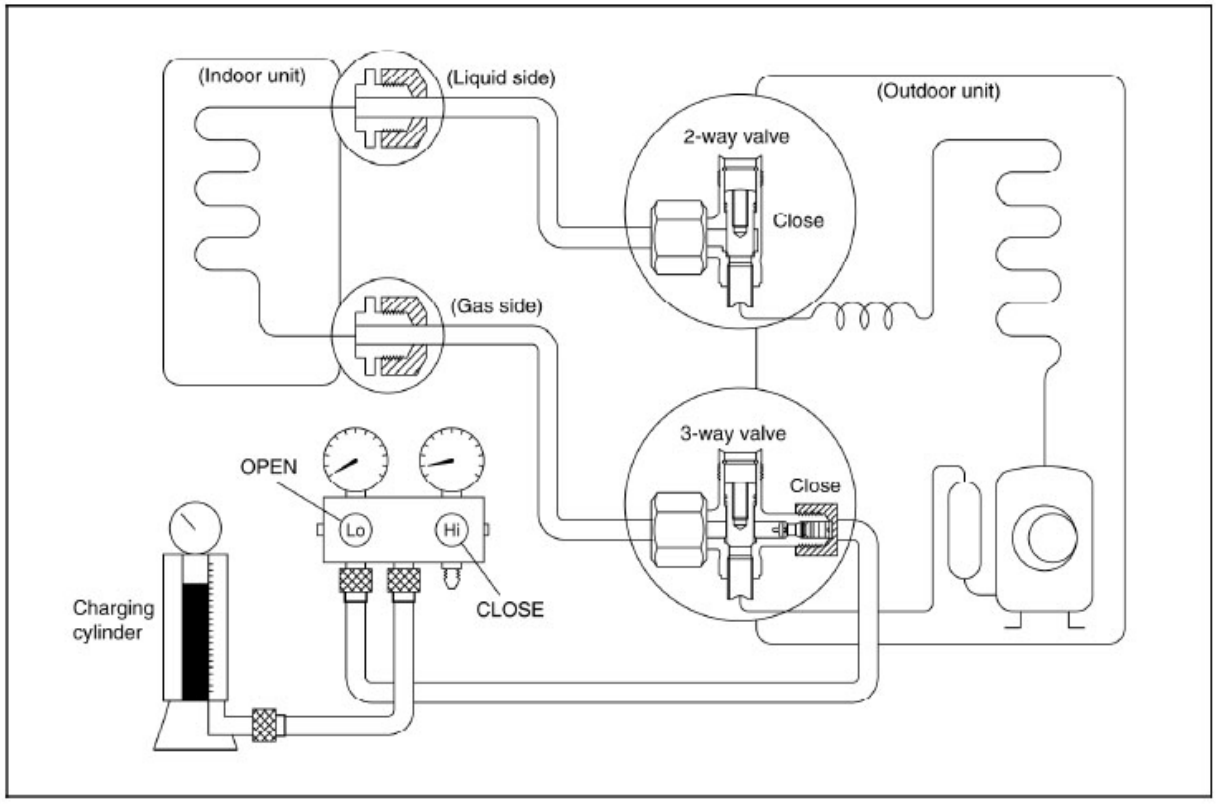
6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points.

Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.

8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

2. Air purging by refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage.

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

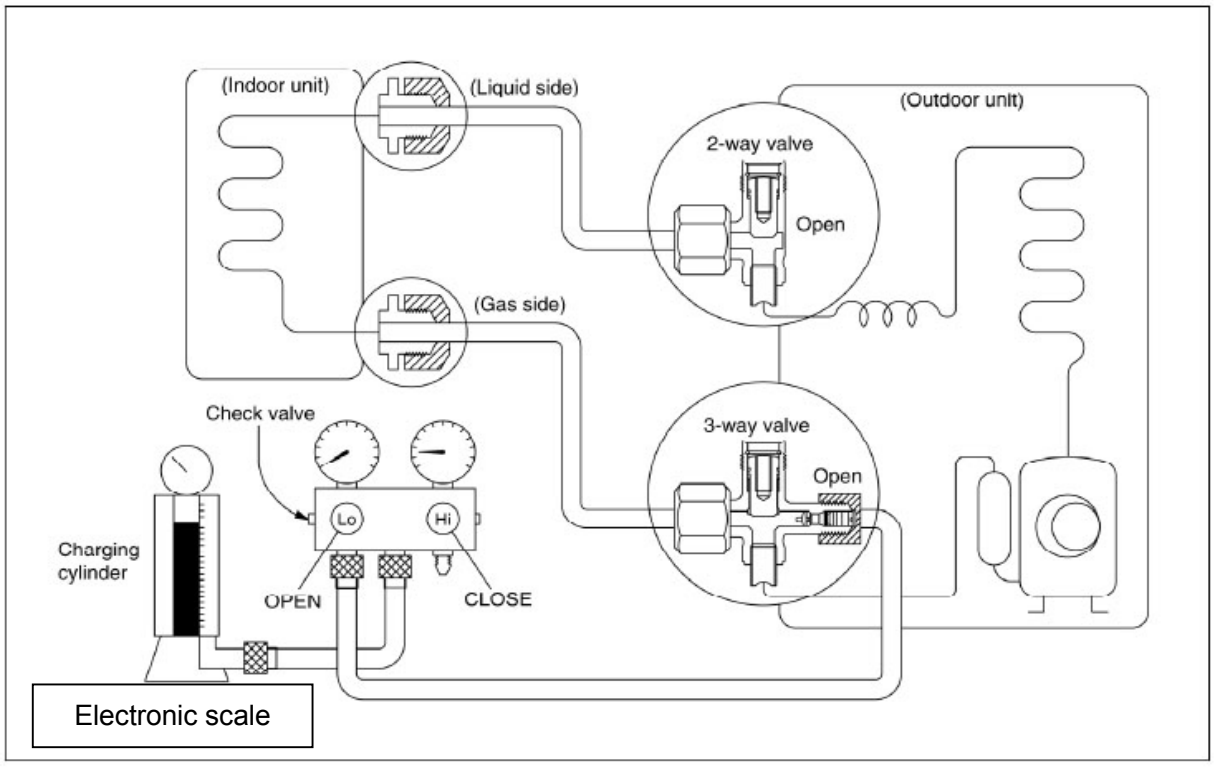
Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

3. Adding the refrigerant if the pipe length >5m



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

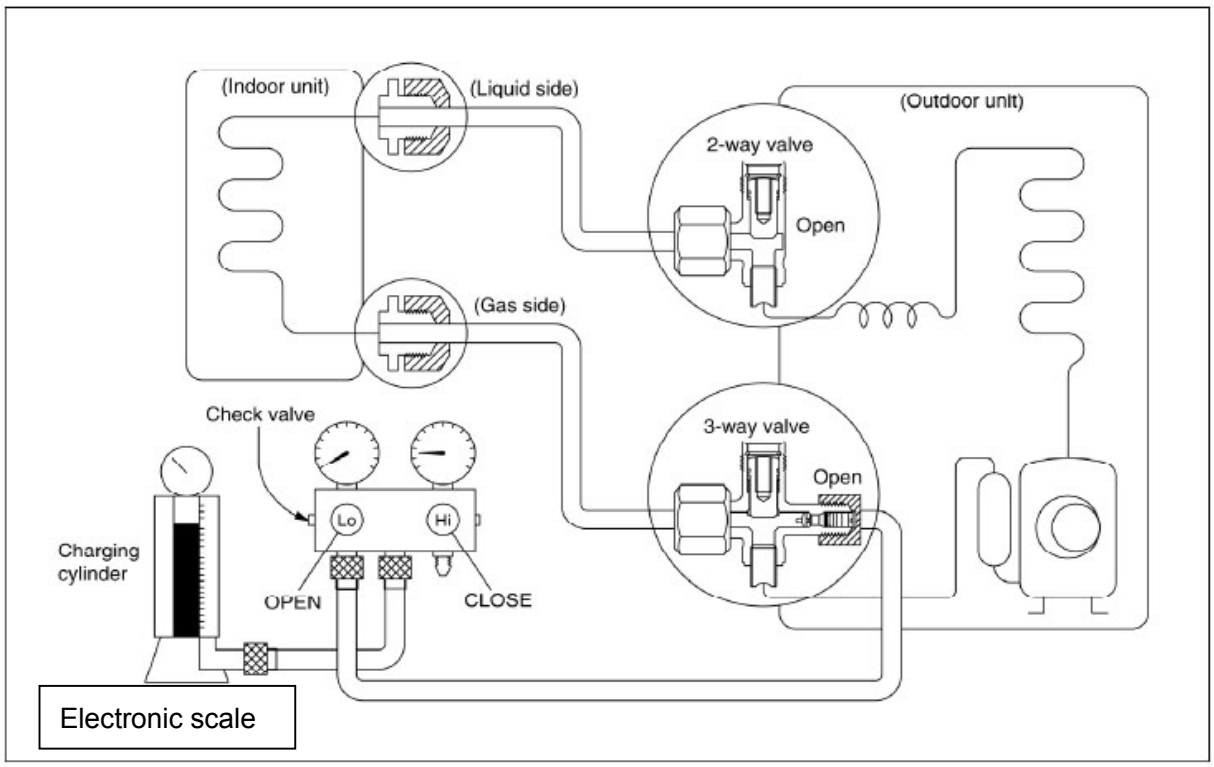
6).When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

6.5 Adding the refrigerant after running the system for many years



Procedure:

1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve. Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

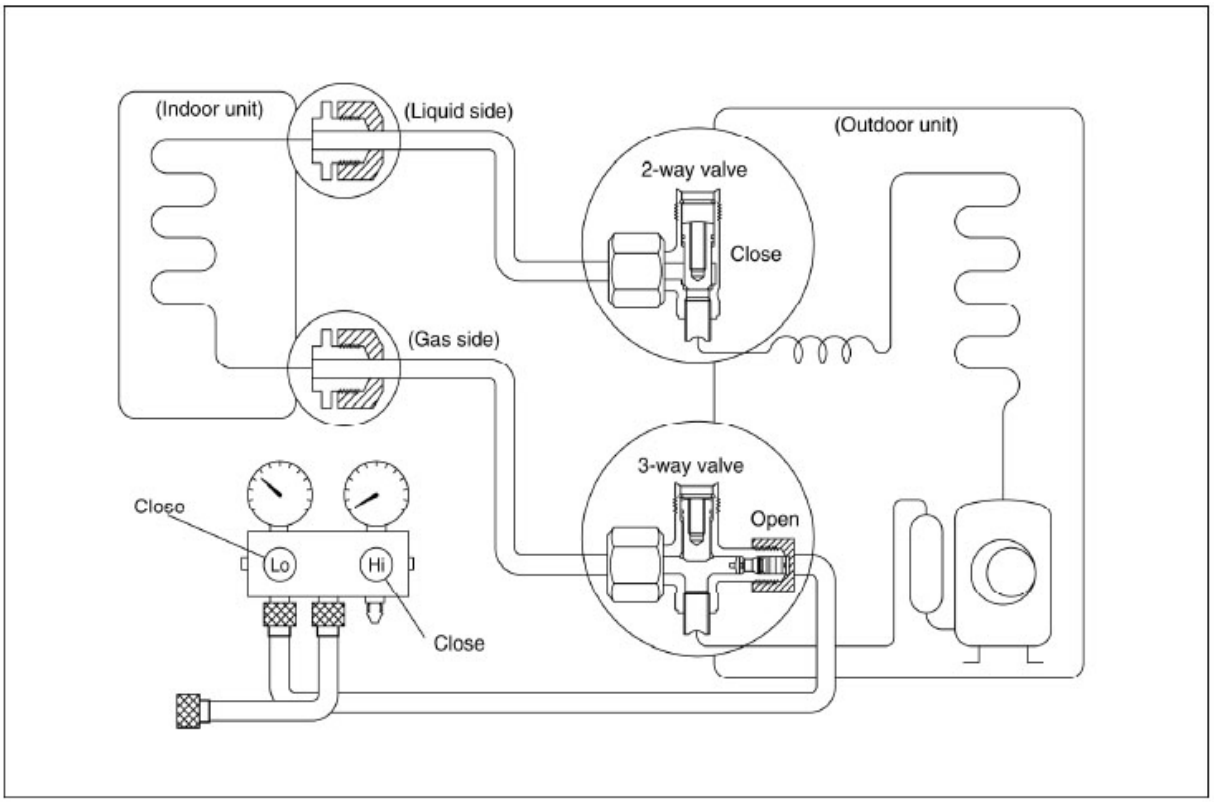
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

6.6 Re-installation while the indoor unit need to be repaired

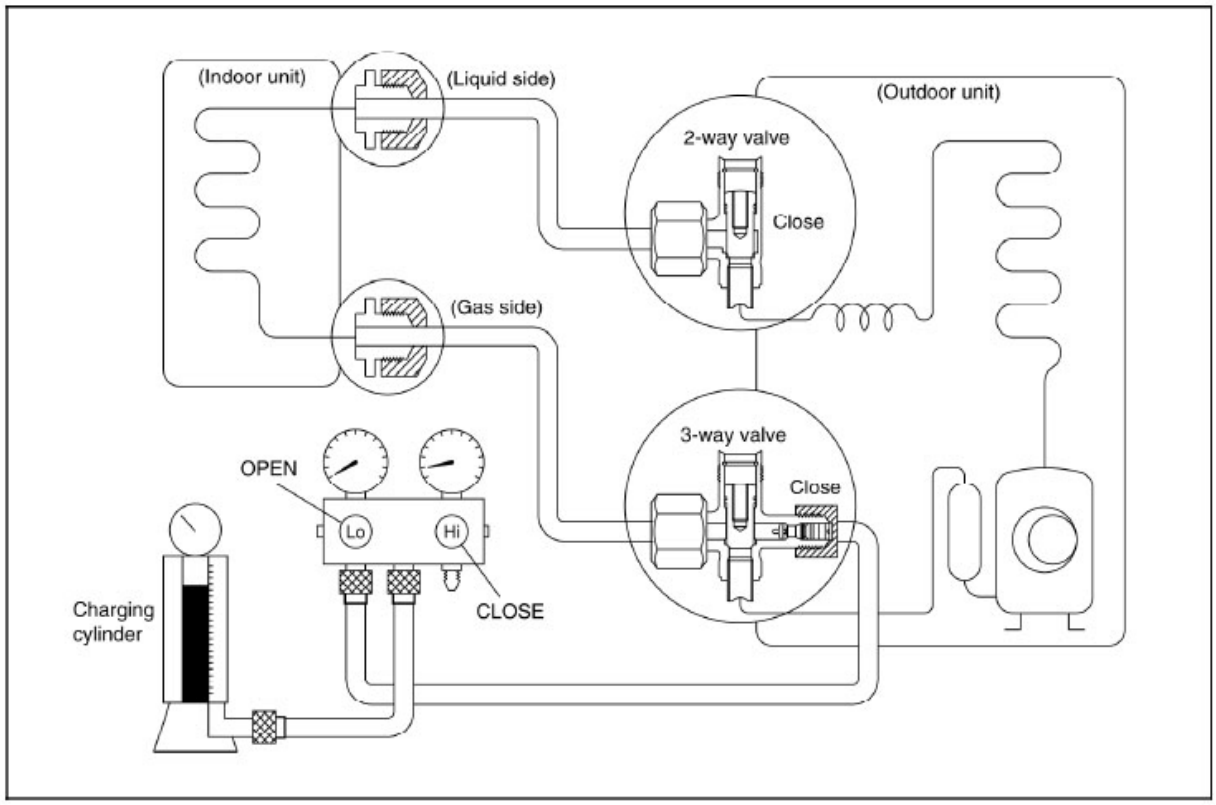
1. Collecting the refrigerant into the outdoor unit



Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position
Remove the valve stem caps and confirm that the valve stems are in the opened position.
Be sure to use a hexagonal wrench to operate the valve stems.
2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.
3). Air purging of the charge hose.
Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.
4). Set the 2-way valve to the close position.
5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.
6). Set the 3-way valve to the closed position immediately
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.
Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.
Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.
Be sure to check for gas leakage.

2. Air purging by the refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve

Leave the valve on the charging cylinder closed.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45’ for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position

Be sure to use a hexagonal wrench to operate the valve stems.

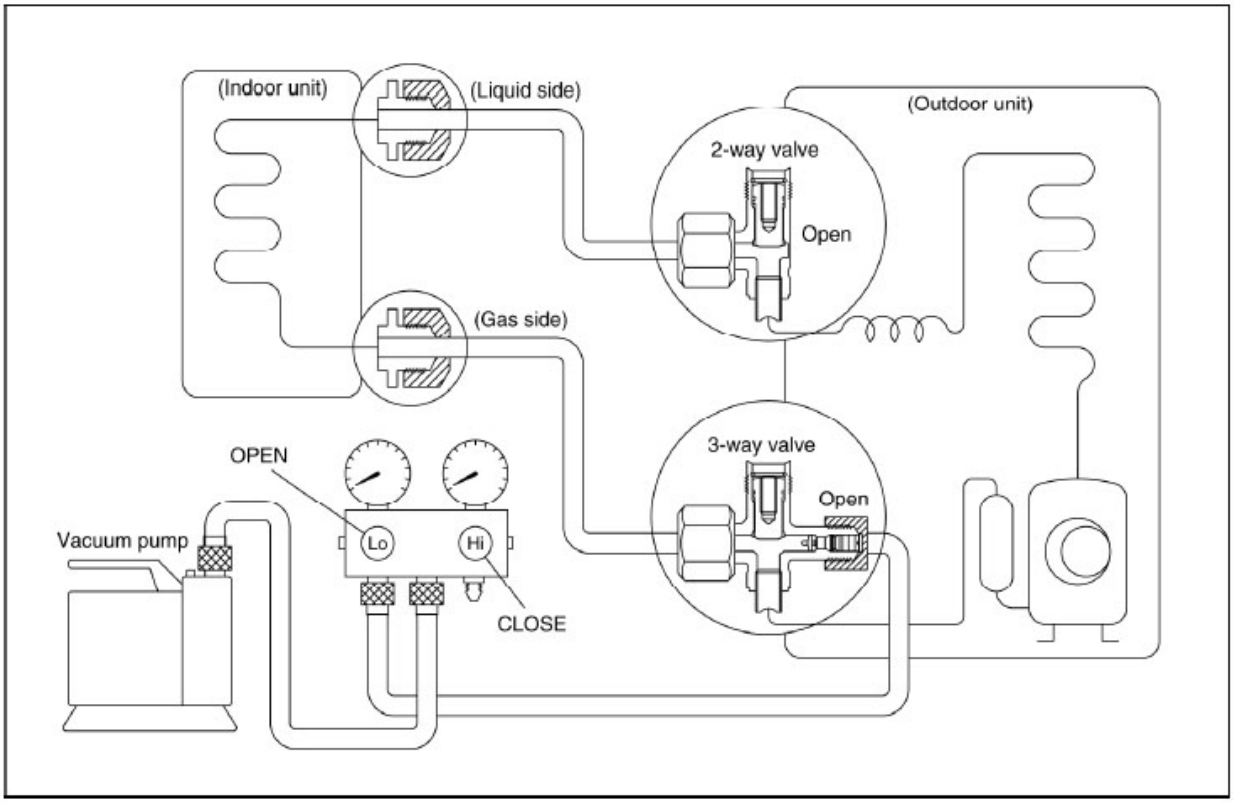
7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

6.7 Re-installation while the outdoor unit need to be repaired

1. Evacuation for the whole system



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

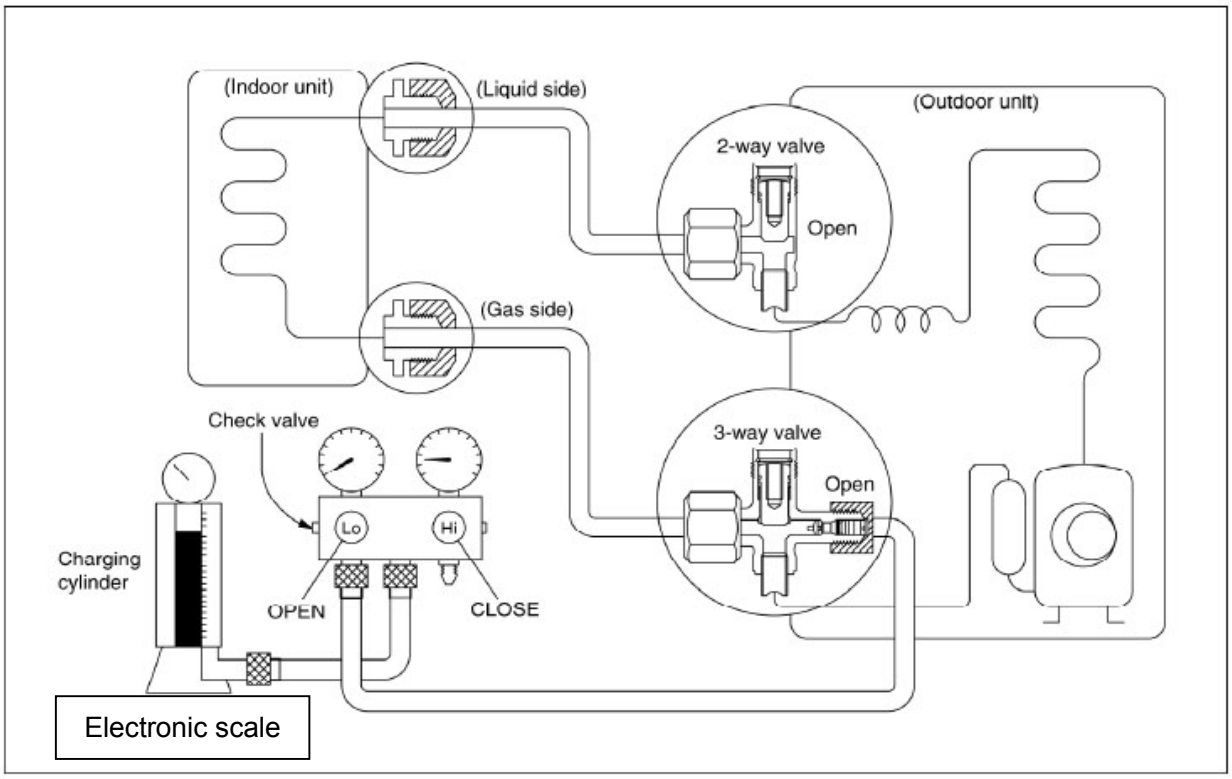
2). Connect the vacuum pump to 3-way valve's service port.

3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa.

4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant

If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately

If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage

7. Operation characteristics

Mode / Temperature	Cooling operation	Drying operation
Room temperature	≥17	> 10℃
Outdoor temperature	0℃~50℃ (-15℃ ~ 50℃:For the models with low temperature cooling system)	0℃~ 50℃

CAUTION:

1. If air conditioner is used outside of the above conditions, certain safety protection features may come into operation and cause the unit to function abnormally.

2. Room relative humidity less than 80%. If the air conditioner operates in excess of this figure, the surface of the air conditioner may attract condensation. Please sets the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. Optimum performance will be achieved within this operating temperature.

8. Electronic function

8.1 Abbreviation

T1: Indoor room temperature

T2: Coil temperature of evaporator

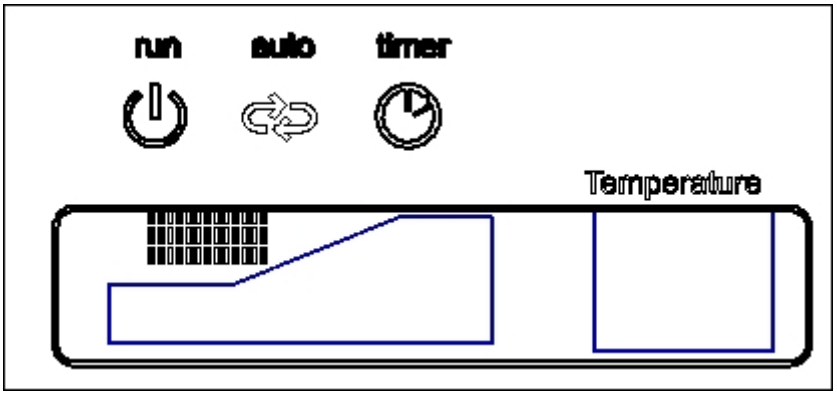
T3: Coil temperature of condenser

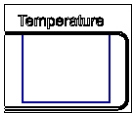
T4: Outdoor ambient temperature

T5: Compressor discharge temperature

8.2 Display function

8.2.1 Icon explanation on indoor display board.



	Run indicator Flash at 0.5Hz when the unit is standby. Illuminate when the unit is turned on.
	Auto indicator This indicator illuminates when the air conditioner is in AUTO operation.
	Timer indicator This indicator illuminates when TIMER is set ON/OFF.
	**TEMPERATURE indicator** Usually it displays the temperature settings. When change the setting temperature, this indicator begins to flash, and stops 20 seconds later. It displays the room temperature when the air conditioner is in FAN only operation, and the range of that is 0~50 . It will also display the error codes when malfunction or protection happen.

8.3 Main Protection

8.3.1 Three Minutes Delay at restart for compressor.

---- 1 minutes delay for the 1st time start-up and 3 minutes delay for others.

8.3.2 Temperature protection of compressor top.

---- Top temp. protector cut off for 30s and restart the compressor with 3 minutes delay.

8.3.3 Temperature protection of compressor discharge.

When the compressor discharge temperature is getting higher, the running frequency will be limited as below rules:

----Compressor discharge temp. T5>115□ for 5s;compressor stop.

---- 108<T5<115□ , decrease the frequency to the lower level every 3 minutes.

---90<T5<105□ , keep running as the current frequency.

----T5<90□, no limit for frequency or restart compressor

8.3.4 Fan Speed is out of control.

---- When Indoor Fan Speed is too low (lower than 300RPM for 50 seconds), the unit stops and LED displays failure

8.3.5 Inverter module Protection.

----Inverter module Protection itself has a protection function against current, voltage and temperature. If these protections happened, the corresponding code will display on indoor unit LED. The unit will stop operation if the protection occurred, and recover 3min delay after the protection disappeared.

8.3.6 Indoor fan delayed open function

----When system starts up, the louver will be active immediately and the indoor fan will open after 10s.

8.3.7 Compressor preheating functions.

----Preheating permitting condition:

If the main relay closed, T4＜3□ and the machine is first power on, or T4＜3□ and compressor has stopped for over 3 hours, the compressor heating cable will work.

----Preheating mode:

A weak current flows through the coil of compressor from the wiring terminal of compressor, then the compressor is heated without operation.

----Preheating release condition:

If T4＞5□ or user turns on the machine and compressor runs, preheating function will stop.

---- Crankcase Heater

It starts when T4<5□ and stops when T4>15□

8.4 Operation Modes and Functions

8.4.1 Fan only mode.

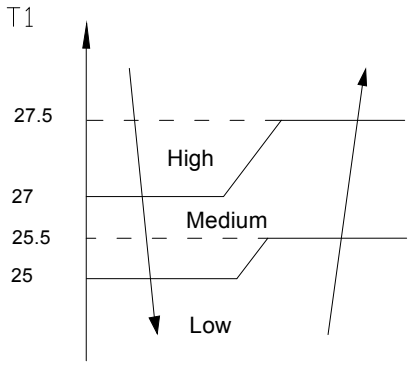
(1) Outdoor fan and compressor stop.

(2) Temperature setting function is disabled, and no setting temperature is display.

(3) Indoor fan can be set to high/med/low/auto.

(4) The louver operates same as in cooling mode.

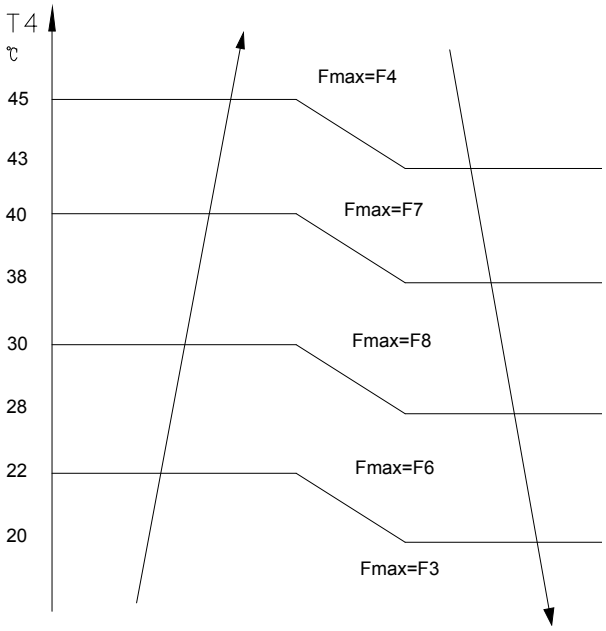
(5) The action of auto fan in fan-only mode is the same as auto fan in cooling mode with 24□ setting temperature.



8.4.2 Cooling Mode

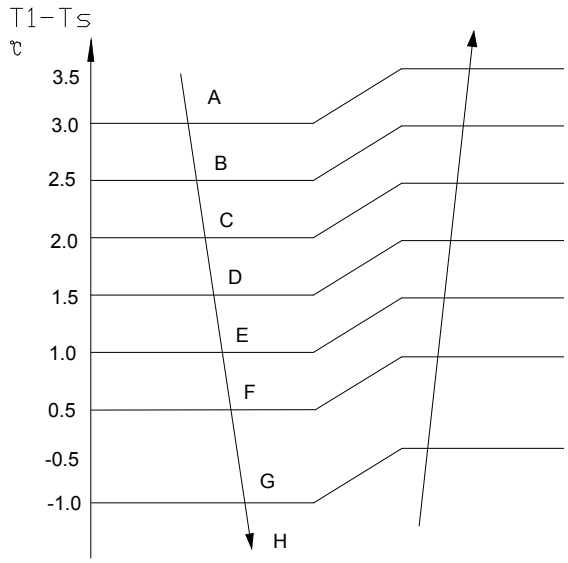
8.4.2.1 Compressor running rules:

The operation frequency of compressor after starting submits to following rule.



After A/C starts up, the compressor will run at the Fmax frequency for 7 minutes. During the 7 minutes, frequency limitation is active.

7 minutes later, compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency.

Note:

When T1-Ts keep in the same temperature zone for 3 minutes, the compressor will run as the below rules:

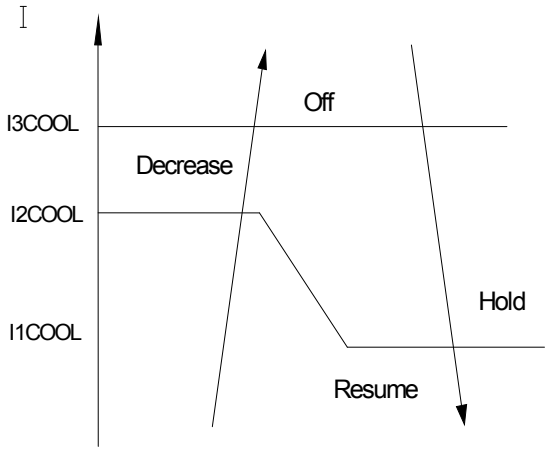
A~E: Increase the frequency to the higher level until to F8.

F: Keep the current frequency.

G: Decrease the frequency to the lower level until to F1.

H: Run at F1 for 1h (if T1-Ts<-2□ , compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.



Off: Compressor stops.

Decrease: Decrease the running frequency to the lower level.

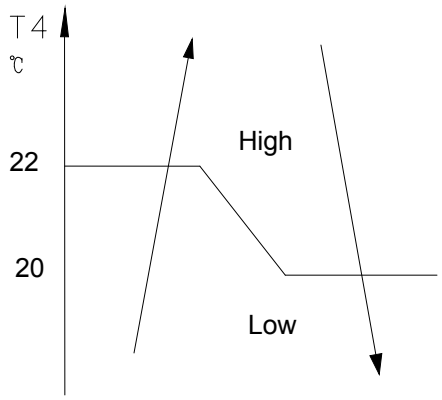
Hold: Keep the current frequency.

Resume: No limitation for frequency.

Note:

When AC is in “hold” zone for 3 minutes, the compressor frequency will rise to the higher level.(frequency will increase twice at most)

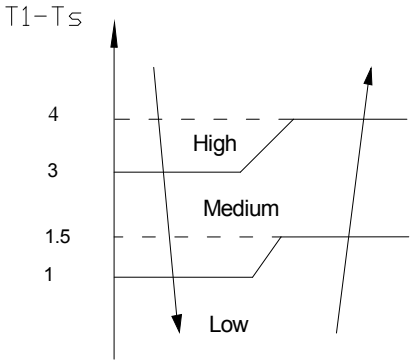
8.4.2.2 Outdoor fan running rules:



8.4.2.3 Indoor fan running rules

In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto.

Auto fan in cooling mode acts as follow:



8.4.2.4 Condenser high temperature protection.

When 55□ <T3<60□ , the compressor frequency will decrease to the lower levelevery 3 min until to F1

and then run at F1.

When T3<52℃, the compressor will not limit the frequency again and resume to the former frequency.

When T3>60℃ for 5 seconds, the compressor will stop and restart until T3<52℃.

8.4.2.5 Evaporator low temperature protection.

When T2<0℃, the compressor will stop and restart when T2≥5℃.

When 0℃≤T2<4℃, the compressor frequency will decrease to the lower level every minute until stop the compressor.

When 4℃≤T2≤7℃, the compressor will keep the current frequency.

When T2>7℃, the compressor frequency will not be limited.

8.4.3 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃.

In auto mode, the machine will choose cooling or fan-only mode according to ΔT (ΔT =T1-Ts).

ΔT=T1-Ts	Running mode
ΔT＞1℃	Cooling
ΔT≤1℃	Fan-only

Indoor fan will run at auto fan of the relevant mode.

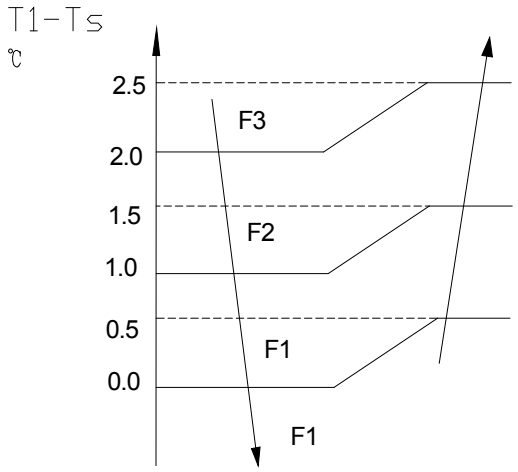
The louver operates same as in relevant mode.

If the setting temperature is modified, the machine will rechoose running function.

8.4.4 Dehumidify mode

8.4.4.1 Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.

8.4.4.2 Compressor running rules



8.4.4.3 Low indoor room temperature protection

In drying mode, if room temperature is lower than 10□ , the compressor will stop and not resume until room temperature exceeds 12□ .

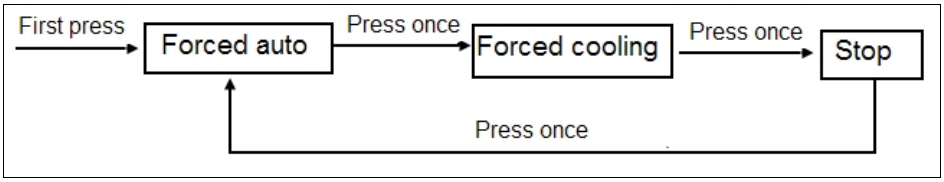
8.4.4.4 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

8.4.4.5 The outdoor fan operates same as in cooling mode.

8.4.5 Forced operation function

8.4.5.1 Enter forced operation function:

Pressing the touch button once, the machine will transfer into forced auto mode, if pressing the button once again, the machine will turn into forced cooling mode, the third pressing will stop the unit, and the forth pressing is the start of the cycle of forced auto mode, forced cooling mode and stop. Refer the following chart:



8.4.5.2 In forced operation mode, all general protections and remote control are available.

8.4.5.3 Operation rules:

Forced cooling mode:

The compressor runs at F2 frequency and indoor fan runs as breeze. Running 30 minutes, the machine will turn to auto mode as 24□ setting temperature.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24□ setting temperature.

8.4.6 Timer function

8.4.6.1 Timing range is 24 hours.

8.4.6.2 Timer on. The machine will turn on automatically when reaching the setting time.

8.4.6.3 Timer off. The machine will turn off automatically when reaching the setting time.

8.4.6.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

8.4.6.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

8.4.6.6 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

8.4.6.7 The setting time is relative time.

8.4.7 Sleep function mode

8.4.7.1 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off.

8.4.7.2. Operation process in sleep mode is as follow:

After pressing ECONOMIC or SLEEP button on controller, the machine will turn into sleep mode.

When cooling, the setting temperature rises 1□ (be lower than 30□) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed.

8.4.7.3 Timer setting is available

8.4.7.4 When user uses timer off function in sleep mode(or sleep function in timer off mode), if the timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

8.4.8 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including Swing function)

automatically after 3 minutes when power returns.

If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes and turn to auto mode as 24□ setting temp.

If A/C is off before power off and AC is required to start up now, the compressor will have 1 minutes delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

8.4.9 Vertical louver control function(Optional for some models)

Total four type operations for vertical louver control function: original orientation, orientation, vane adjustment and horizontal swing.

8.4.9.1 Original orientation means when power on, the louver will turn to the datum mark. This action has the highest priority. The other action of vertical louver can't act until the original orientation action stopped.

8.4.9.2 Orientation means after the original orientation action, the louver turn the middle position of upper limit position and lower limit position.

8.4.9.3 Vane adjustment, pressing the control button on the remote controller to make the vertical louver turn left and right. Each pressing, the louver will turn 6℃. If pressing the button during the original orientation, the louver will only turn 6℃after the original orientation action stopped regardless the pressing time. No action when the unit is stopped.

8.4.9.4 Horizontal swing means the louver can auto swing horizontally in the allowable range if pressing the button on the remote controller. Pressing once, the louver starts movement, the second pressing is to stop the moving.

If indoor fan stopped, the horizontal swing is invalid.

8.4.10 8℃ Heating(optional)

In heating operation, the preset temperature of the air conditioner can be as lower as 8℃, which keeps the room temperature steady at 8℃ and prevents household things freezing when the house is unoccupied for a long time in severe cold weather.

9. Troubleshooting

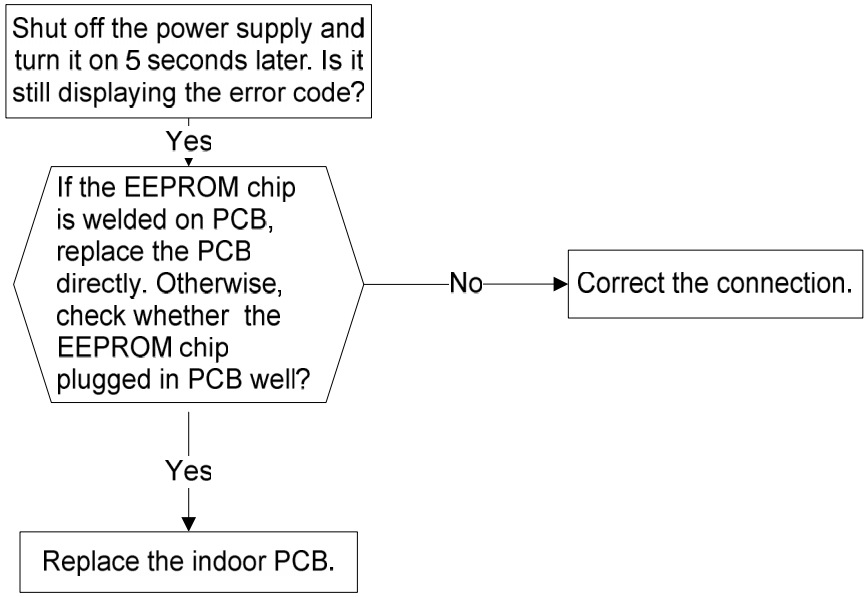
9.1 Indoor Unit Error Display

Display	LED STATUS
E0	EEPROM parameter error
E1	Indoor / outdoor units communication protection
E2	Zero-crossing signal error
E3	Indoor fan speed has been out of control
E5	Open circuit or short circuit of outdoor temperature sensor
E6	Open circuit or short circuit of room or evaporator temperature sensor
P0	IPM malfunction or IGBT over-strong current protection
P1	Over voltage or too low voltage protection
P4	Inverter compressor drive error

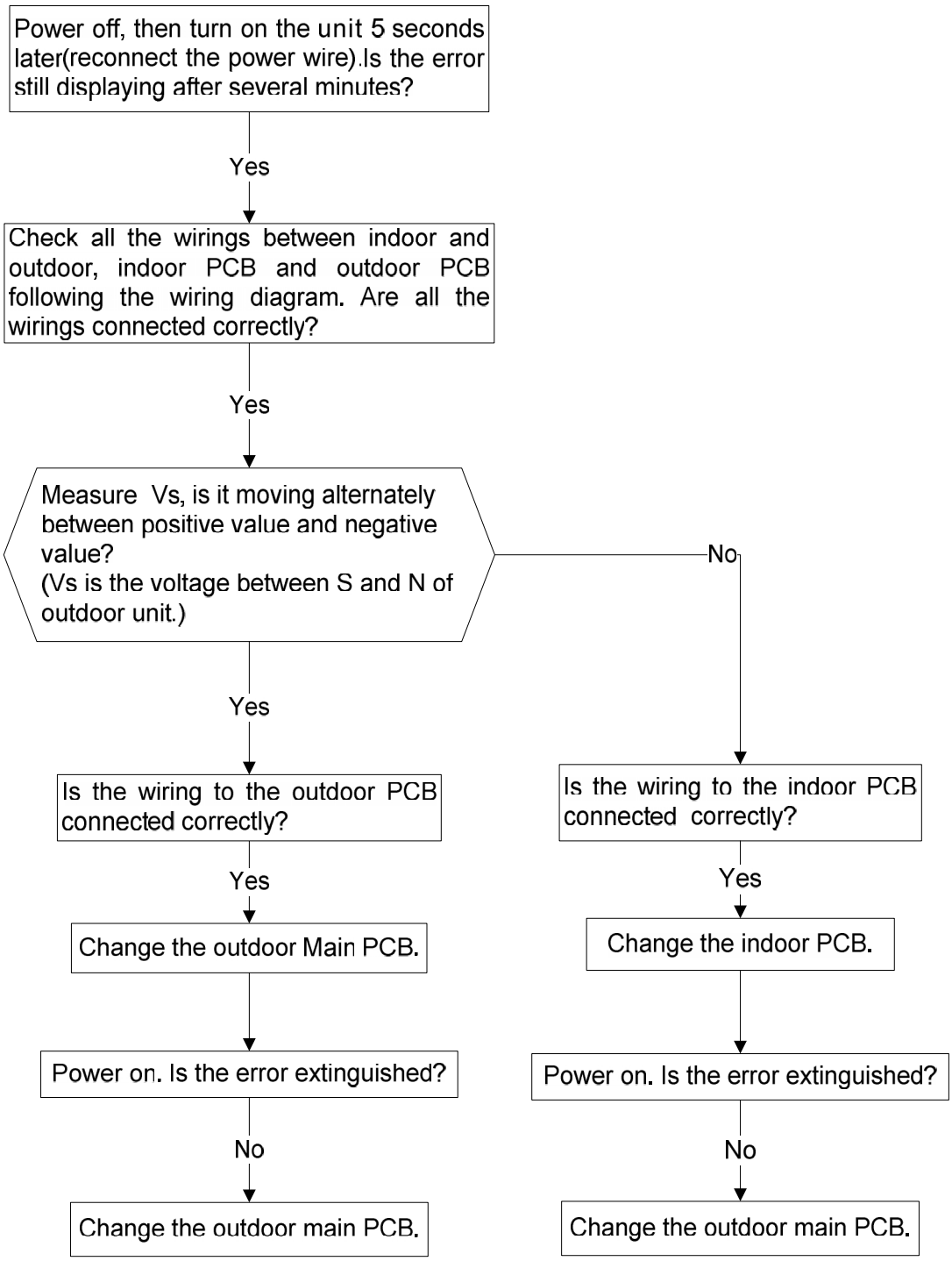
Note: E4 & P3: Reserved function

9.2 Diagnosis and Solution

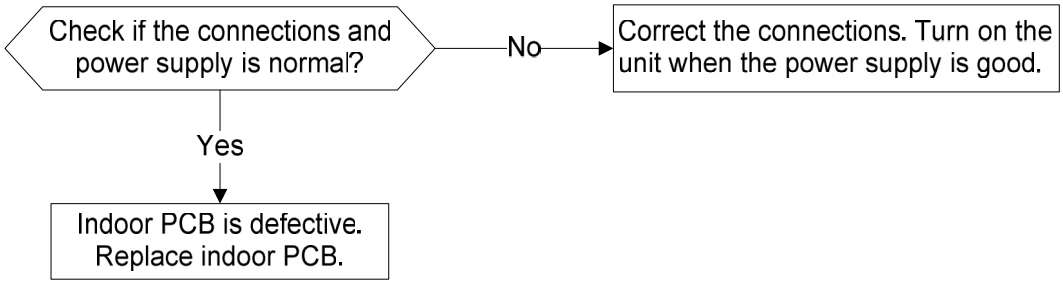
9.2.1 EEPROM parameter error diagnosis and solution(E0)


Shut off the power supply and turn it on 5 seconds later. Is it still displaying the error code?
Yes
If the EEPROM chip is welded on PCB, replace the PCB directly. Otherwise, check whether the EEPROM chip plugged in PCB well?
No
Correct the connection.
Yes
Replace the indoor PCB.

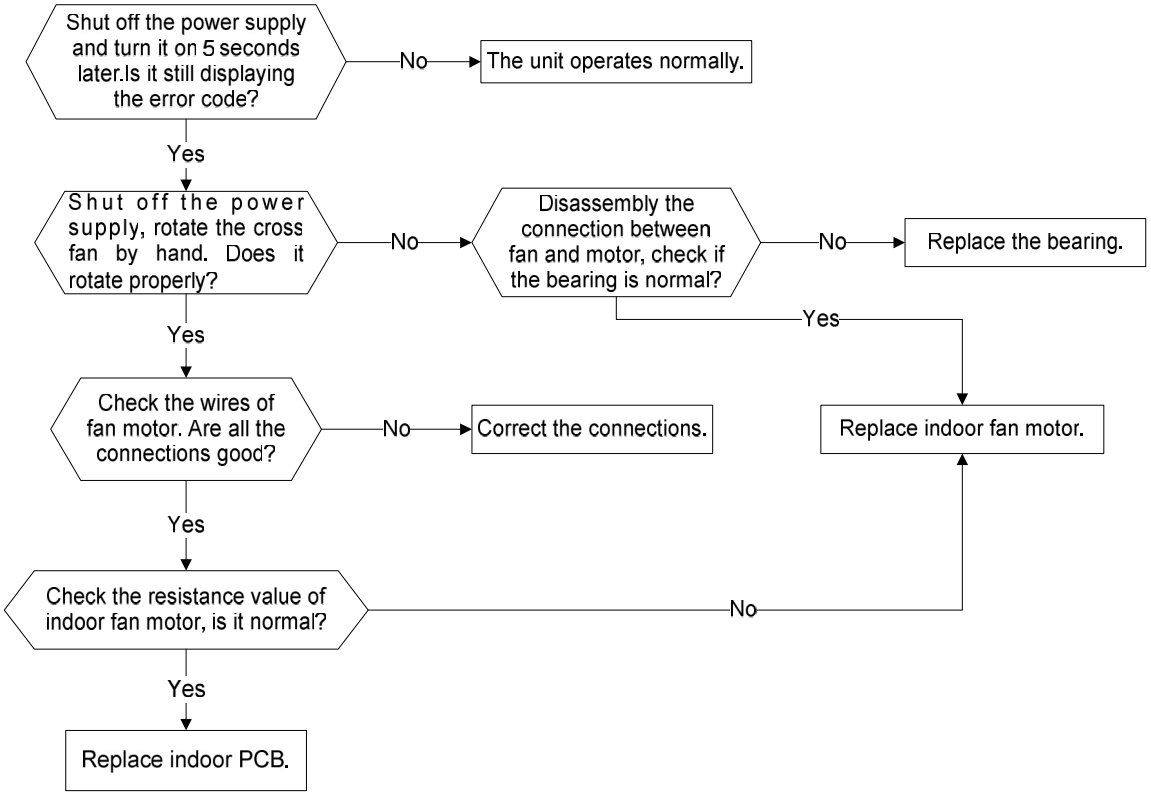
9.2.2 Indoor unit and outdoor unit communication protection error diagnosis and solution(E1)


Power off, then turn on the unit 5 seconds later(reconnect the power wire).Is the error still displaying after several minutes?
Yes
Check all the wirings between indoor and outdoor, indoor PCB and outdoor PCB following the wiring diagram. Are all the wirings connected correctly?
Yes
Measure Vs, is it moving alternately between positive value and negative value?
(Vs is the voltage between S and N of outdoor unit.)
No
Yes
Is the wiring to the outdoor PCB connected correctly?
Yes
Change the outdoor Main PCB.
Power on. Is the error extinguished?
No
Change the outdoor main PCB.
Is the wiring to the indoor PCB connected correctly?
Yes
Change the indoor PCB.
Power on. Is the error extinguished?
No
Change the outdoor main PCB.

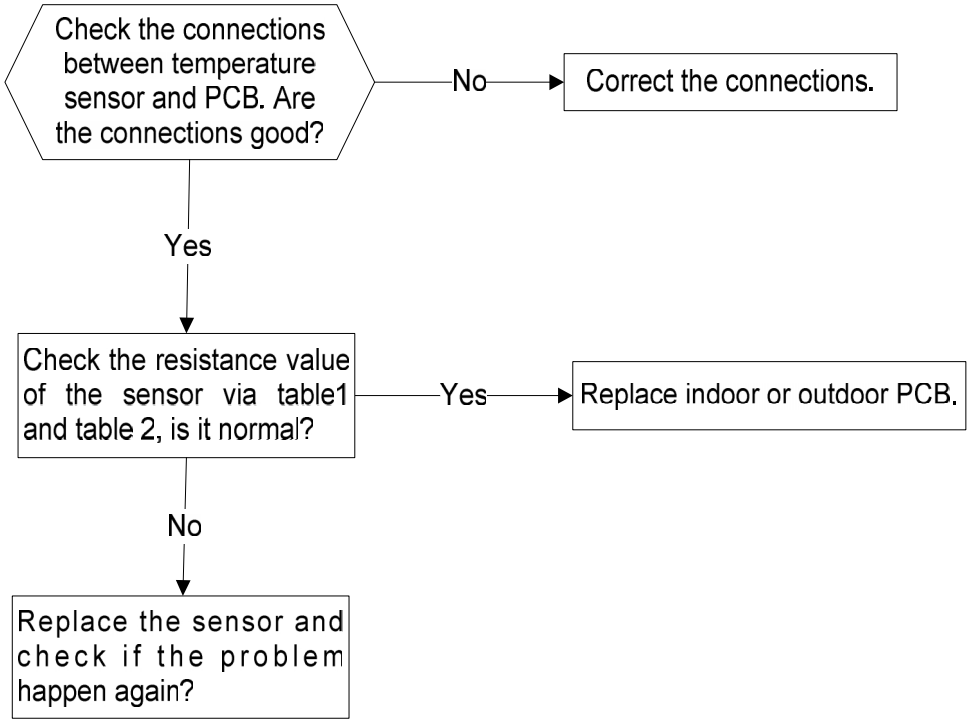
9.2.3 Zero crossing detection error diagnosis and solution(E2)


Check if the connections and power supply is normal?
No
Correct the connections. Turn on the unit when the power supply is good.
Yes
Indoor PCB is defective. Replace indoor PCB.

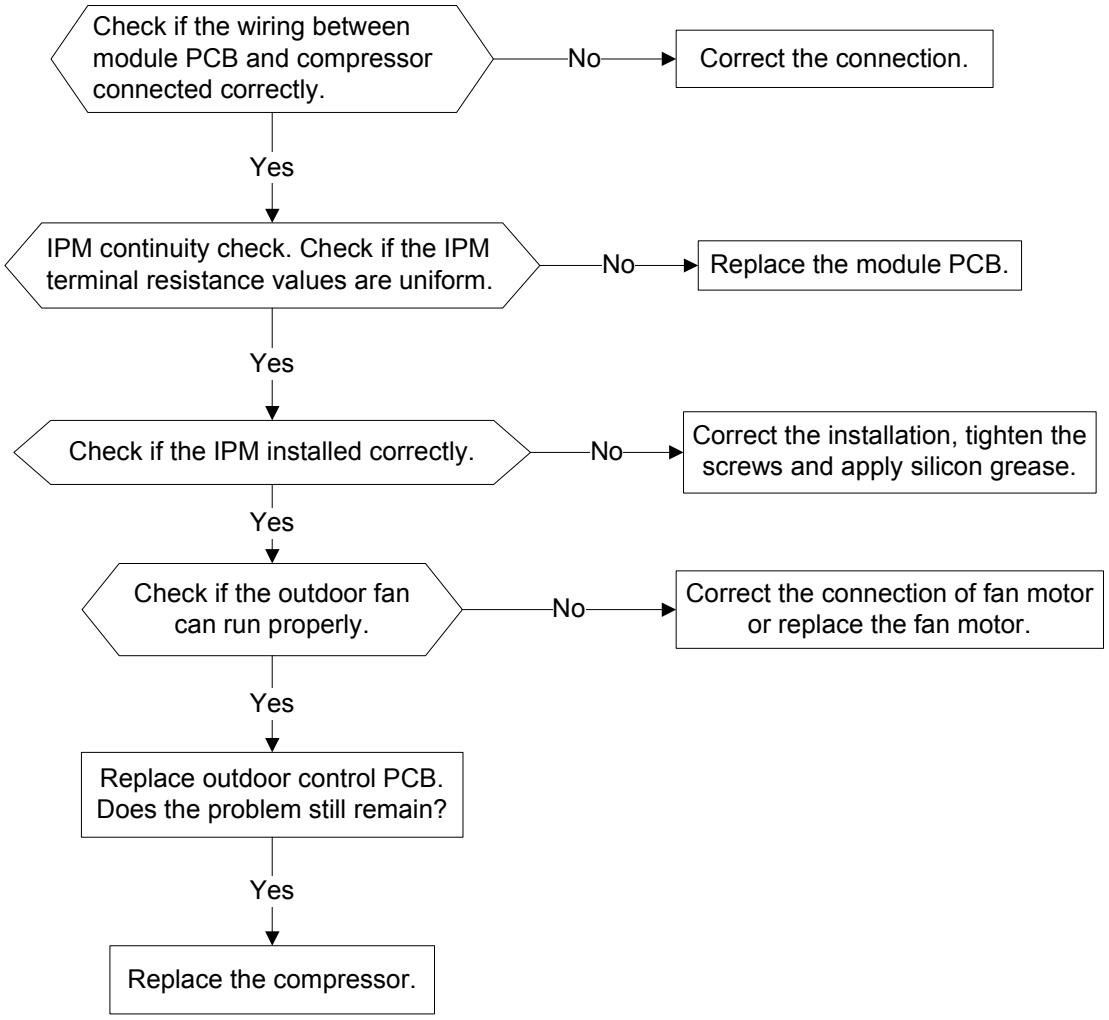
9.2.4 Indoor fan speed has been out of control diagnosis and solution(E3)


Shut off the power supply and turn it on 5 seconds later.Is it still displaying the error code?
No
The unit operates normally.
Yes
Shut off the power supply, rotate the cross fan by hand. Does it rotate properly?
No
Disassembly the connection between fan and motor, check if the bearing is normal?
No
Replace the bearing.
Yes
Yes
Check the wires of fan motor. Are all the connections good?
No
Correct the connections.
Replace indoor fan motor.
Yes
Check the resistance value of indoor fan motor, is it normal?
No
Yes
Replace indoor PCB.

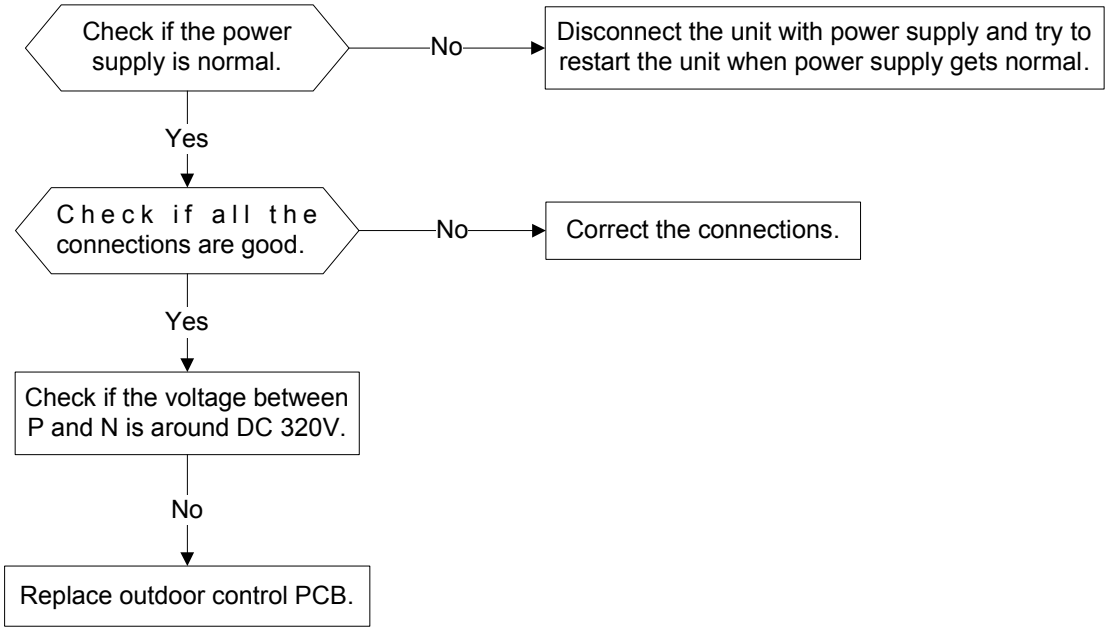
9.2.5 Open circuit or short circuit of temperature sensor diagnosis and solution(E5,E6)


Check the connections between temperature sensor and PCB. Are the connections good?
No
Correct the connections.
Yes
Check the resistance value of the sensor via table1 and table 2, is it normal?
Yes
Replace indoor or outdoor PCB.
No
Replace the sensor and check if the problem happen again?

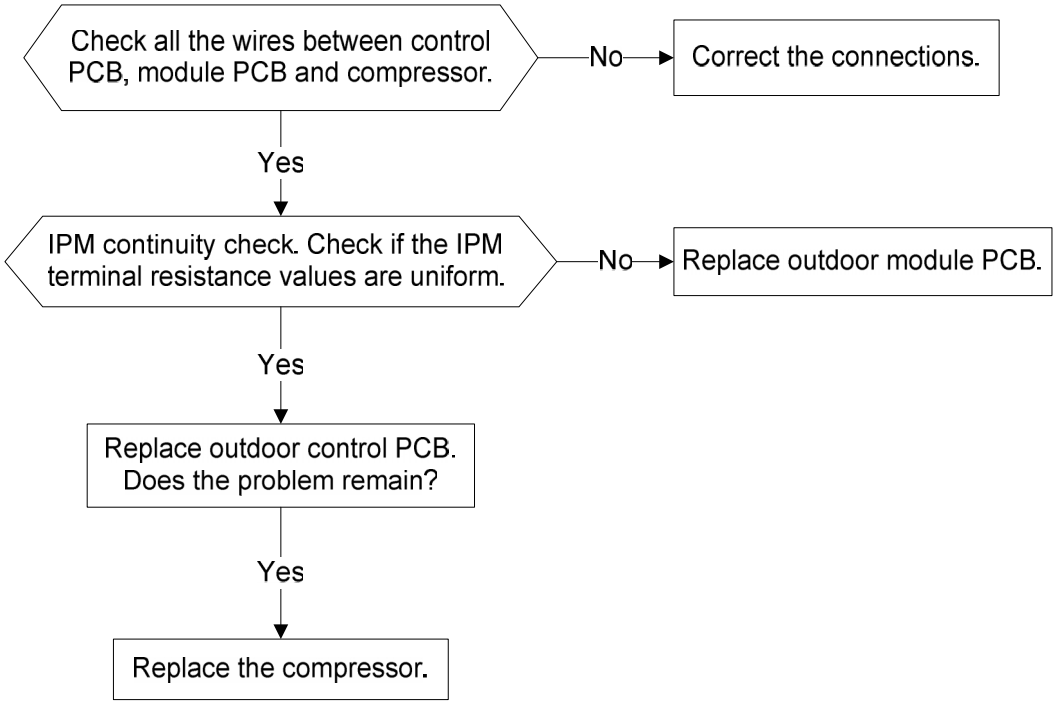
9.2.6 IPM malfunction IGBT over-strong current protection diagnosis and solution(P0)


Check if the wiring between module PCB and compressor connected correctly.
No
Correct the connection.
Yes
IPM continuity check. Check if the IPM terminal resistance values are uniform.
No
Replace the module PCB.
Yes
Check if the IPM installed correctly.
No
Correct the installation, tighten the screws and apply silicon grease.
Yes
Check if the outdoor fan can run properly.
No
Correct the connection of fan motor or replace the fan motor.
Yes
Replace outdoor control PCB. Does the problem still remain?
Yes
Replace the compressor.

9.2.7 Over voltage or too low voltage protection diagnosis and solution(P1)


Check if the power supply is normal.
No
Disconnect the unit with power supply and try to restart the unit when power supply gets normal.
Yes
Check if all the connections are good.
No
Correct the connections.
Yes
Check if the voltage between P and N is around DC 320V.
No
Replace outdoor control PCB.

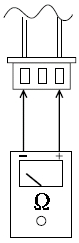
9.2.8 Inverter compressor drive error diagnosis and solution(P4)


Check all the wires between control PCB, module PCB and compressor.
No
Correct the connections.
Yes
IPM continuity check. Check if the IPM terminal resistance values are uniform.
No
Replace outdoor module PCB.
Yes
Replace outdoor control PCB. Does the problem remain?
Yes
Replace the compressor.

Main parts check

1. Temperature sensor checking

   Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Tester

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

Table 1:Some frequently-used R-T data for T1,T2,T3 and T4 sensor:

Temperature (℃)	5	10	15	20	25	30	40	50	60
Resistance Value (KΩ)	26.9	20.7	16.1	12.6	10	8	5.2	3.5	2.4

Table 2:Some frequently-used R-T data for T5 sensor:

Temperature (℃)	5	15	25	35	60	70	80	90	100
Resistance Value (KΩ)	141.6	88	56.1	36.6	13.8	9.7	6.9	5	3.7

Resistance value (KΩ)